

IMPORTANT BIRD AND BIODIVERSITY AREAS IN INDIA

Priority sites for Conservation

Revised and updated 2nd Edition Vol. I



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**Second Edition: Revised and Updated
Volume I**

Asad R. Rahmani, M. Zafar-ul Islam and Raju M. Kasambe

Maps prepared by

Mohit Kalra and Noor I. Khan

Team Members

Noor I. Khan, Siddesh Surve, Abhijit Malekar and Nandkishor Dudhe

Significant Contribution to this edition

**Anwaruddin Choudhury, Arvind Mishra, Ajai Saxena, Dhananjai Mohan, Himmat Singh
Pawar, Intesar Suhail, Khursheed Ahmad, Neeraj Srivastava, P.O. Nameer, Manoj Nair,
Mrutyumjaya Rao, Praveen, J., Sanjeeva Pandey, S. Subramanya, Satya Prakash**

Editors

Gayatri Ugra and Maithreyi, M.R.

Layout and Design

V. Gopi Naidu

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Bombay Natural History Society,

Hornbill House, Shaheed Bhagat Singh Road, Mumbai-400001, INDIA.

Telephone: 0091-22-28429477 and 0091-22-22821811. Fax: 0091-22-22837615.

Email: info@bnhs.org; websites: www.bnhs.org and www.ibcn.in

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JAMMU AND KASHMIR



KHURSHED AHMAD

Zaskar is a major chain of mountains in Kashmir

The state of Jammu & Kashmir falls under the Western Himalayan and Trans-Himalayan biogeographical region of India, and is at the intersection between the temperate Palaearctic and tropical Oriental biogeographic regions of the world. Owing to the enormous diversity of habitat types, great altitudinal span of the mountains, and climatic variations, Jammu & Kashmir encompasses a diversity of plant and animal species, many of which are endemic or near-endemic to this area.

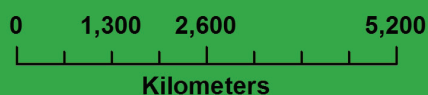
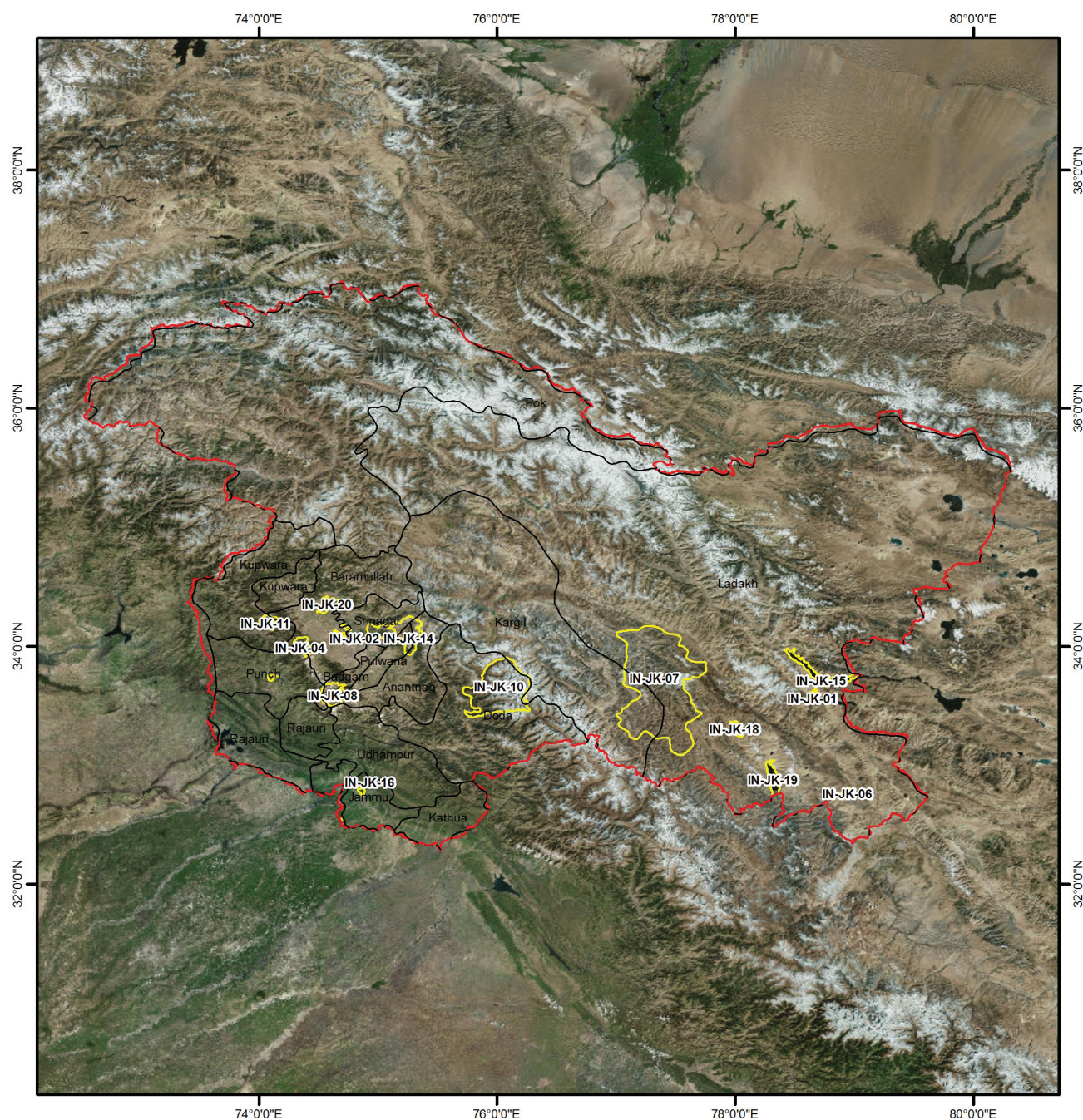
Jammu & Kashmir (32° 17' 37" 05' N and 72° 31' 80" 20' E) is bounded on the north by China (Karakoram range), on the east by Tibet, on the west by Pakistan and Afghanistan, and to the south by Himachal Pradesh and Punjab. This hilly state is divided into three geographical regions, namely, the temperate valley and mountains of Kashmir, the cold desert of Ladakh and the subtropical plains of Jammu. The higher regions are covered by Pir Panjal, Karakoram, and the inner Himalayan ranges. The climate varies from subtropical in the Jammu region to cold and arid in Ladakh. The state has a geographical area of 22.22 million ha (6.8% of India's geographical area). It is the only state in India with one capital in summer and another in winter. Srinagar is the

capital city in summer and Jammu is the winter capital.

Agriculture is the mainstay of the State's economy. Rice *Oryza sativa*, wheat *Triticum aestivum*, and maize *Zea mays* are the major crops. Barley *Hordeum vulgare*, bajra *Pennisetum glaucum*, and jowar *Sorghum vulgare* are cultivated in some parts. Kashmir handicrafts have always been a byword for excellence. This sector provides employment to about 0.2 million people. Kashmir carpets earn substantial foreign exchange (Mathew 2003). The 300 km Srinagar-Jammu National Highway and the 265 km Mughal Road via Pir Panjal mountains are the two major surface links between the Kashmir Valley and the rest of the country. Kashmir is internationally known for its beauty and is a favourite tourist destination. The main tourist centres are Srinagar, Pahalgam, Gulmarg, and Sonamarg. Hindu pilgrim centres of special importance include Amarnath and Vaishno Devi. Ladakh has also become a major tourist destination, bringing problems of over-crowding, litter, and uncontrolled mushrooming of hotels.

The total human population of the State according to the 2001 Census was 10.07 million, which was about 1.0% of the country's population. Nearly 75% of the people lived

Important Bird Areas in Jammu and Kashmir



IN-JK

in the villages. The population density was 45 persons per sq. km, which is very low compared with other states. This is due to the large uninhabited cold desert area in Ladakh. The human population increased to 12,548,000 in 2010, an increase of about 23% in 10 years (Population Census 2010).

The Tibetan Plateau and Pir Panjal Range are a source of many major rivers, such as the Indus and the Jhelum, which start from this region, but much of the water is drained internally, where the rivers end in vast lakes and marshes. These inland wetlands, particularly marshes and peat bogs, absorb and hold huge quantities of fresh water which they release slowly during both dry and wet seasons, preventing floods and providing sufficient water for the sustenance of millions of people. The wetlands of J&K include the Dal and Wular Lakes, Hokarsar, Haigam, Shallabugh, and Mirgund Wetland Reserves in the Kashmir Valley; Pangong Tso, Tso Moriri, Tso Kar, Chushul, and Hanle marshes in the Ladakh region; and Gharana in Jammu region. Besides supporting many species of wetland plants, animals, and insects, these wetlands provide critical habitats for ducks, geese, swans, and many other waterfowl species. Such lakes and marshes, mostly freshwater and saline respectively, are important as wintering and/or breeding grounds for a diversity of waterfowl such as the Vulnerable Black-necked Crane *Grus nigricollis*, as well as Greylag Goose *Anser anser*, Bar-headed Goose *Anser indicus*, Great Crested Grebe *Podiceps cristatus*, Mallard *Anas platyrhynchos*, Ferruginous Duck *Aythya nyroca*, and Blunt-winged Warbler *Acrocephalus concinens*, besides a variety of other waterfowl.

The wetlands of Kashmir Valley are important for both resident and migratory waterfowl. They are major wintering areas for a variety of migratory ducks and geese, and extremely important breeding areas for some species. They are particularly important for long distance migrants, as a stopover site for feeding and resting. Many waterbirds occur in huge numbers in the wetlands of Jammu & Kashmir, much above the proportion of the total species abundance (1%) determined by Wetlands International (2012) as one of the criteria for declaring a wetland as a Ramsar Site.

As per the information of the Department of Ecology, Environment and Remote Sensing, there are 1230 lakes and waterbodies in the state, with 150 in Jammu region, 415 in Kashmir region and 665 in Ladakh. In order to protect and conserve these lakes, Lakes and Water Development Authority (LAWDA) has been created by the Government of Jammu & Kashmir as an autonomous body under the Development Act, 1970 vide Government order No. 117 of HUD dated 11.04. 1997 to serve as one point agency to manage and conserve the waterbodies and waterways of the state.

Jammu & Kashmir has four Ramsar sites (Surinsar-Mansar, Hokarsar, Wular and Tsomoriri). Islam & Rahmani

(2008) have identified seven more wetlands that fulfills the Ramsar Criteria (Chushul marshes, Haigam Conservation Reserve, Hanle marshes, Mirgund Conservation Reserve, Pangong Tso, Shallabugh Conservation Reserve, and Tso Kar basin).

Vegetation

Broadly, Jammu & Kashmir has five types of vegetation, namely Subtropical Dry Evergreen, Himalayan Moist Temperate, Himalayan Dry Temperate, Subalpine and Alpine Forests. The recorded forest area is 2.02 million ha, which constitutes 9% of the geographical area of the State. Forests are largely distributed in the Kashmir Valley and Jammu region. Dense forest and open forest account for 1,184,800 ha and 938,900 ha respectively, according to the Ministry of Environment and Forests (2001). There are 22 districts in the State. The western districts have more forest cover with dense and open forests. Reasi, Poonch, Kathua, and Jammu have more forest cover than Ladakh, Gilgit, Baramulla, and Anantnag (Ministry of Environment and Forests 2001). Ladakh region, being part of Trans-Himalaya, is devoid of forest vegetation, although this area is now being extensively planted with Willow *Salix* spp., which is affecting bird life. Ladakh region is a wellknown cold desert with highly adapted flora and fauna (Gujja *et al.* 2003).

IBAs and Protected Areas

Jammu & Kashmir has been the pioneer state in the field of conservation and has had a network of wildlife protected areas (Game Reserves) from the time of the erstwhile Maharajas of the state. These game reserves were covered by the former Game Preservation Act, 1852 which was revised and updated as the J&K Wildlife Protection Act, 1978 (Amended 2002). Some of the sanctuaries were established nearly one hundred years ago, mainly to protect the catchment of important lakes and to provide good hunting for the Maharaja. Since then the State Government has notified about 16,000 sq. km under the Protected Area Network (PAN) which is 15.6% of the total geographical area of the State, comprising five National Parks, 14 Wildlife Sanctuaries, and 35 Conservation Reserves. The Protected Areas (PAs) include 2,762 sq. km of forest (12.76% of 20,230 sq. km total forest area). The remaining 13,150 sq. km is the high altitude cold desert area of Ladakh. It is remarkable that at the national level, 4.8% of the total geographical area is under the PAN, whereas percentage coverage of PAs in J&K is nearly 3 times more than the national average. J&K has also got the largest number of PAs in the country, i.e., 53. In terms of the geographical coverage of the PAs also, the State is second only to Gujarat.

In 2004, BNHS and BirdLife International had identified 21 Important Bird Areas (Islam & Rahmani 2004). Since the publication of *Important Bird Areas in India*, seven areas

IBAs of Jammu & Kashmir		
IBA site codes	IBA site names	IBA criteria
IN-JK-01	Chushul Marshes	A1
IN-JK-02	Dachigam National Park	A1, A2, A3
IN-JK-03	Dehra Gali (DKG) Forest	A1, A2
IN-JK-04	Gulmarg Wildlife Sanctuary	A1, A2, A3
IN-JK-05	Haigam Rakh Wetland Conservation Reserve	A1, A4iii
IN-JK-06	Hanle Plains/Marshes Wetland Conservation Reserve	A1
IN-JK-07	Hemis High Altitude National Park	A3
IN-JK-08	Hirpora Wildlife Sanctuary	A1, A2
IN-JK-09	Hokarsar Wetland Conservation Reserve	A1, A4iii
IN-JK-10	Kishtwar National Park	A1, A2, A3
IN-JK-11	Lachipora Wildlife Sanctuary	A1, A2
IN-JK-12	Limber Valley Wildlife Sanctuary	A1, A2, A3
IN-JK-13	Mirgund Jheel and Reserve	A1, A4i
IN-JK-14	Overa-Aru Wildlife Sanctuary	A1, A2, A3
IN-JK-15	Pangong Tso	A1, A3
IN-JK-16	Ramnagar Wildlife Sanctuary	A1
IN-JK-17	Shallabugh Conservation Reserve	A4iii
IN-JK-18	Tso Kar Basin	A1
IN-JK-19	Tso Moriri Lake and Adjacent Marshes	A1, A4i
IN-JK-20	Wular Lake and Associated Marshes	A1, A4iii
IN-JK-21	Gharana Wetland Conservation Reserve	A4iii
IN-JK-22	Aharbal-Kounsarnag Forests	A1, A2
IN-JK-23	Gurez Valley	A2, A3
IN-JK-24	Kanji Wildlife Sanctuary	A3
IN-JK-25	Rangdum	A3
IN-JK-26	Sheshera Reserve Forest	A3
IN-JK-27	Shikargarh Conservation Reserve, Tral	A1, A2, A3
IN-JK-28	Suru Valley	A3

have been added to the state IBA list (Rahmani *et al.* 2012) so now total IBAs in Jammu & Kashmir are 28.

Of the Protected Areas, Dachigam National Park is of special ecological significance as it harbours the last viable population of the globally Threatened Kashmir Red Deer or Hangul *Cervus elaphus hanglu*. Wular Lake, situated in Baramulla district, comprising an area of 8,900 ha, is a wetland of international importance which was declared as one of the first six Ramsar Sites in India in 1990. Of the four national parks, three have been identified as IBAs.

AVIFAUNA

Jammu & Kashmir lies in the Western Himalaya Endemic Bird Area (EBA 128) where 11 restricted-range species have been listed by Stattersfield *et al.* (1998). Because of great altitudinal variation and differing physiogeographical regions, Jammu & Kashmir has three biomes: Biome 5 (Eurasian High Montane -- Alpine and Tibetan) above 3,600 msl; Biome 7 (Sino-Himalayan Temperate Forest) mainly c. 1,800 to 3,600 msl; and Biome 8 (Sino-Himalayan Subtropical

Forest) between c. 1,000 and 2,000 msl. The Eurasian High Montane (Alpine and Tibetan) Biome is mainly distributed in the Ladakh region, especially in Changthang plateau. The Sino-Himalayan Temperate Forest type habitat is present in most of the IBAs in the State.

In the Kashmir Valley, many protected areas support restricted-range species and some water bodies support large congregations of migratory waterbirds. These restricted-range species occur mainly in Temperate Coniferous or Broadleaf Forest, Subalpine Forest, and Montane Grasslands. For example, the Kashmir Flycatcher *Ficedula subrubra*, which is considered a globally Threatened species, is found between 1,800 and 2,700 msl in Temperate Mixed Broadleaf Forest, especially where there is dense growth of *Parrotia Parrotiopsis jacquemontiana* (Stattersfield *et al.* 1998). Other similar species, namely Tytler's Leaf-warbler *Phylloscopus tytleri* and White-throated Tit *Aegithalos niveogularis* are found between 1,500 and 3,600 msl in Pine, Oak, and Mixed Deciduous Forests. Other restricted-range species which are found in or near the Valley are the Kashmir

Nuthatch *Sitta cashmirensis*, Spectacled Finch *Callacanthus burtoni*, and Orange Bullfinch *Pyrrhula aurantiaca*. The two finches are found in open Coniferous Forest, Mixed Woodland Forest, Deciduous Forest, and occasionally in stands of Birch (Stattersfield *et al.* 1998).

The Changthang region in Ladakh is an important breeding ground for waterbirds. Apart from hosting the largest breeding congregation of Bar-headed Goose *Anser indicus* in India, the Changthang region also supports the largest population of the globally Vulnerable Black-necked Crane *Grus nigricollis* in India (Chandan *et al.* 2008a).

During a study on its breeding ecology, Pfister (1998) recorded 12 sites in the Changthang region as breeding sites for this Vulnerable species and counted 38 Black-necked Cranes. In a subsequent survey of Changthang in 2001, 42 individuals were counted, with 10 breeding pairs in the Changthang region (S.A. Hussain, *pers. comm.* 2003). During subsequent years, a study on the status and ecology of the Black-necked Crane was conducted by WWF-India. Till 2011, six new nesting sites were recorded (Chandan *et al.* 2006). During the 2011 WWF survey, a population of 81 Black-necked Crane was recorded in Ladakh.

AVIFAUNA OF ENDEMIC BIRD AREA 128: WESTERN HIMALAYA IN IBAS OF J&K

Western Tragopan	<i>Tragopan melanocephalus</i>	IN-JK-03, 10, 11, 12
Cheer Pheasant	<i>Catreus wallichii</i>	IN-JK-12, 10
Tytler's Leaf-warbler	<i>Phylloscopus tytleri</i>	IN-JK-02, 14, 22, 23, 27
Kashmir Flycatcher	<i>Ficedula subrubra</i>	IN-JK-02, 03, 04, 08, 14, 27
Kashmir Nuthatch	<i>Sitta cashmirensis</i>	IN-JK-14, 02,
Orange Bullfinch	<i>Pyrrhula aurantiaca</i>	IN-JK-02, 14, 23, 27

LIST OF THREATENED BIRDS OF JAMMU & KASHMIR

CRITICALLY ENDANGERED

White-rumped Vulture	<i>Gyps bengalensis</i>	IN-JK-16
Slender-billed Vulture	<i>Gyps tenuirostris</i>	IN-JK-16

ENDANGERED

Egyptian Vulture	<i>Neophron percnopterus</i>	IN-JK-02, 08
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VULNERABLE

Marbled Teal	<i>Marmaronetta angustirostris</i>	IN-JK-20
Pallas's Fish-eagle	<i>Haliaeetus leucoryphus</i>	IN-JK-05, 09, 20
Greater Spotted Eagle	<i>Aquila clanga</i>	IN-JK-06
Eastern Imperial Eagle	<i>Aquila heliaca</i>	IN-JK-02
Western Tragopan	<i>Tragopan melanocephalus</i>	IN-JK-03, 10, 11, 12
Cheer Pheasant	<i>Catreus wallichii</i>	IN-JK-12
Sarus Crane	<i>Grus antigone</i>	IN-JK-21 (?)
Black-necked Crane	<i>Grus nigricollis</i>	IN-JK-01, 06, 15, 18, 19
Kashmir Flycatcher	<i>Ficedula subrubra</i>	IN-JK-02, 03, 04, 08, 14

NEAR THREATENED

Oriental Darter	<i>Anhinga melanogaster</i>	IN-JK-20
Ferruginous Pochard	<i>Aythya nyroca</i>	IN-JK-05, 09, 19, 20
Long-billed Bush-warbler	<i>Bradypterus major</i>	--

Another IBA in Ladakh is the Hemis National Park, which is important for all the high altitude birds of the Western Himalaya. About 80 bird species are found in the Park and 50 of them breed there. The important bird species recorded by Khursheed (1999, *pers. comm.* 2012) in Markha Valley of Hemis National Park include Bearded Vulture or Lammergeier *Gypaetus barbatus*, Red-billed Chough *Pyrrhocorax pyrrhocorax*, Yellow-billed Chough *Pyrrhocorax graculus*, Robin Accentor *Prunella rubeculoides*, Common

Great Rosefinch *Carpodacus rubicilla*, Streaked Great Rosefinch *C. rubicilloides*, Black-throated Thrush *Turdus ruficollis*, and Brown Accentor *Prunella fulvescens*.

Changthang in Ladakh is a huge area and many wetlands and other important spots (e.g., Sumdo near Puga) are included in this IBA. There are many small wetland sites which are important breeding grounds for waterbirds but do not fulfill IBA criteria, so the Changthang plateau as a whole could be considered one IBA. This does not mean

that the individual wetlands are not important. All the sites are part of the IBA and should be well protected. Otto Pfister has suggested that the Changthang region could be divided into three areas, from the conservation point of view. These areas are: Pangong Tso region (northern Changthang Wilderness Area, including Pangong Tso, Chushul, Harong, and Lungparma), Hanle region (eastern Changthang Wilderness Area, including Hanle plain, Lalpari, Staklung, and Fukche) and Tso Moriri region (western Changthang Wilderness Area, including Tso Kar plain, Puga, Tso Moriri, and Chumur).

The Jammu region has mixed types of forest. The districts of Udhampur, Jammu, Kathua, Reasi, and Poonch are very important for the species of Biome 8. Detailed studies have not been conducted and very little is known about the birds here, except for a couple of rapid surveys by Baba (Wildlife Warden) in 1999–2000. The area between 500 and 1500 msl is particularly denuded, and certainly requires more study (Trevor Price, *pers. comm.* 2011). Ramnagar Wildlife Sanctuary is one of the important IBAs in Jammu region. It harbours 30 species of breeding birds, besides a variety of other important biodiversity.

Threatened Species

In Jammu & Kashmir, historically, 18 globally Threatened species have been recorded (till 2011), such as the Siberian Crane *Grus leucogeranus* from Leh, White-headed Duck *Oxyura leucocephala* and Lesser White-fronted Goose *Anser erythropus* from Wular Lake, Baikal Teal *Anas formosa* from Mirgund reservoir, Marbled Teal *Marmaronetta angustirostris* from Wular Lake and Mirgund reservoir, and Pallas's Fish Eagle *Haliaeetus leucoryphus* from Wular Lake, Haigam Rakh, Leh, Hokarsar, Chushul, Marbul pass, Tso Moriri Lake, and Hanle. The Greater Spotted Eagle *Aquila clanga* was also reported from Bhaderwah in Jammu (BirdLife International 2001) and the Eastern Imperial Eagle *Aquila heliaca* from Kashmir Valley. Cheer Pheasant (*Catreus wallichii*) was reported from Limber Wildlife Sanctuary and Kishtwar National Park. Sarus Crane *Grus antigone* was reported from Kathua district, at Kishanpur Garuna (Gharana) Wetland Reserve (Choudhury *et al.* 1999, Sahi 1993, Sundar 1999). Eastern Stock Pigeon *Columba eversmanni* was reported from Limber Wildlife Sanctuary (Javed 1992). Some of these species are still found in J&K, but birds such as the Siberian Crane, the White-headed Duck, the Lesser White-fronted Goose, or the Marbled and Baikal Teal have not been reported recently.

In recent years, 15 globally Threatened and Near Threatened species have been recorded from the IBAs in Jammu & Kashmir. Most of the species are widespread, such as Pallas's Fish-eagle, Eastern Imperial Eagle, White-rumped Vulture and Greater Spotted Eagle. The Black-necked Crane is found in the Changthang plateau

in small numbers, their main population is in Tibet, and a wintering population of c. 300 individuals was seen in Bhutan (BirdLife International 2001, Rahmani 2012). Along with neighbouring Himachal Pradesh, Jammu & Kashmir is extremely important for the long-term survival of Western Tragopan *Tragopan melanocephalus* and Cheer Pheasant *Catreus wallichii*. The Western Tragopan is reported from four IBAs (Dehra Gali Forest, Kishtwar, Lachipora and Limber) while the Cheer Pheasant is reported only from Limber Valley Wildlife Sanctuary. Both these species are likely to be present in the surrounding much larger reserve forest areas.

The main breeding population of the Kashmir Flycatcher *Ficedula subrubra* is found in this state. It has been recorded breeding in Overa Wildlife Sanctuary (Price & Jamdar 1990) and in Dachigam National Park in 2003 (Khursheed Ahmad, *unpubl.*, Trevor Price, *pers. comm.* 2012). It has also been recorded from Shikargah Conservation Reserve, Tral (Rahmani *et al.* 2012) where it probably breeds.

THREATENED SPECIES FOR WHICH JAMMU & KASHMIR IS IMPORTANT

Pallas's Fish-Eagle *Haliaeetus leucoryphus* Vulnerable

This species was once very common in the valley of Kashmir. It has probably declined, although the recent dearth of records is partly the result of reduced accessibility (BirdLife International 2001). This bird has been reported from Wular Lake in the past (Unwin 1897, Loke 1946, Ludlow & Kinnear 1933–34); Haigam Rakh (Scott *et al.* 1989); Leh, Ladakh (Ludlow & Kinnear 1933–34); Hokarsar (Scott *et al.* 1989, Khursheed Ahmad, *pers. comm.* 2007), Srinagar, Chushul (Meinertzhagen 1927); Tso Moriri Lake, Ladakh (Osmaston 1925); and Hanle (Oberholser 1900). Now it is reported only from Haigam Rakh, Hokarsar, and Wular Lake and associated marshes (Khursheed, *unpubl.* 2007). In Ladakh, Pfister (2004) found it to be a rare passage migrant in spring (May-June) through the lower reaches of the valley of central Ladakh and the high altitude wetlands of eastern Ladakh upto 4,600 msl.

Western Tragopan *Tragopan melanocephalus* Vulnerable

The Western Tragopan is classified as Vulnerable because its sparsely distributed small population is declining and becoming increasingly fragmented in the face of continuing forest loss and degradation throughout its restricted range (BirdLife International 2001). This species has been reported from Wular (Knox & Walters 1994); Lolab Valley (Lawrence 1895, Baker 1921 – 30); Limber Valley Wildlife Sanctuary (Kaul 1989, Qadri *et al.* 1990, Javed 1992, Akhtar *et al.* 1994); and Kishtwar National Park (Ward 1906 – 08).

In J&K, the bird has historically been distributed only along the Pir Panjal Range (which borders the valley with Himachal) but not towards the inner Greater Himalayan Range (Suhail Intesar, *unpubl.* 2011). It has recently been recorded by Riyaz Ahmad from Badanari, Kalamund, and Hingli locations in Kalamund-Tatakuti Area and Godinuk and Pathra locations in Khara Gali Area of Poonch along southern slopes of Pir Panjal (Riyaz Ahmad, *pers. comm.* 2011).

Cheer Pheasant *Catreus wallichii* Vulnerable

The Cheer Pheasant's small population is naturally fragmented, because it lives in small patches of successional grasslands. Human population pressure, hunting, and changing patterns of land use are leading to its decline, qualifying it as Vulnerable (BirdLife International 2001, 2011). This bird was reported from Kishtwar National Park (Ward 1906--08) and Limber Valley WLS. There is no recent record of a sighting from any area in its range in Jammu & Kashmir (Khursheed, *unpubl.* 2011).

Black-necked Crane *Grus nigricollis* Vulnerable

This species has a small, declining population as a result of the loss and degradation of wetlands, changing agricultural practices and increased human activity in its breeding and wintering grounds. These factors qualify it as Vulnerable (BirdLife International 2001). About 80 individuals are seen at present in the Ladakh region, with about 15 breeding pairs (Chandan *et al.* 2008b).

Kashmir Flycatcher

Ficedula subrubra Vulnerable

This migratory flycatcher has a small population and breeding range, which is also severely fragmented as a result of the destruction of temperate and mixed deciduous forests. It therefore qualifies as Vulnerable (BirdLife International 2001, 2014). The bird is reported from Lolab Valley and Dachigam National Park (Gauntlett 1972, Ahmad 1999), and 15 ringed, April – July 1989 (BNHS ringing data); Rampur-Rajpur Valley, above Wular Lake, “many pairs” (Bates & Lowther 1952), Overa Wildlife Sanctuary (Jamdar 1987, Price & Jamdar 1990), and Pahalgam. Though it is confirmed from four IBAs, its breeding records are available only from Overa WLS (Price & Jamdar 1990) and Dachigam National Park (Khursheed Ahmad, *unpubl.* 2003).

Long-billed Bush-warber *Bradypterus major* Near Threatened

In 1994, the Long-billed Bush-warbler *Bradypterus major* was listed as Vulnerable (Collar *et al.* 1994) which was later changed to Near Threatened (BirdLife International 2001) where it has remained. It has a narrow distribution in the Western Himalaya in Pakistan and India, and in

Xinjiang province of western China (Koelz 1940). In India, its main stronghold is Kashmir, with possible occurrence in Himachal Pradesh and Uttarakhand, although it has not been recorded in recent years (Rahmani 2012). It was reported from Sonamarg to Baltal in the Kashmir Valley (Bates & Lowther 1952). It has not been recorded from any IBA (Rahmani *et al.* 2012). Trevor Price (*pers. comm.* 2012) has not seen it in Overa.

Restricted Range species

In the Western Himalaya (Endemic Bird Area 128), the main habitats are the Temperate Coniferous or Broadleaf Forest, Subalpine Forest and Montane Grassland. These habitats have 11 restricted-range avian species between 1,500 and 3,600 msl. Of these, four are globally Threatened (Stattersfield *et al.* 1998, BirdLife International 2001, 2014). In Jammu & Kashmir 10 are found, the exception being Himalayan Quail *Ophrysia superciliosa* (thought to be extinct) which was distributed in long grass and brushwood on steep hillsides and was reported from Uttarakhand more than 100 years ago. Other restricted-range species in Jammu & Kashmir are the Western Tragopan in the dense undergrowth in Coniferous, Mixed and Oak Forests between 1,350 msl (in winter) and 3,600 msl; Cheer Pheasant on steep grassy slopes, Open Coniferous or Deciduous Forests, appears to like early successional habitats between 1,400 and 3,500 msl; Brooks's Leaf-warbler *Phylloscopus subviridis* has not been reported from any of the IBAs from its habitat of Coniferous and Mixed Forest in drier, cooler areas between 2,100 and 3,600 msl; Tytler's Leaf-warbler *Phylloscopus tytleri* is reported from Dachigam National Park in Coniferous Forest, with dwarf willows and birches near the tree line between 2,400 and 3,100 msl. Breeding of the Kashmir Flycatcher *Ficedula subrubra* is restricted to Kashmir, but it winters down to the south of India in Tamil Nadu, Kerala, and in Sri Lanka. In Jammu & Kashmir, it is reported from Dachigam National Park (Gauntlett 1972, Ahmad 1999), Dehra Gali in Jammu (Tahir Shawl, *pers. comm.* 2003), Gulmarg Wildlife Sanctuary, Overa-Aru Wildlife Sanctuary, and Hirpora (Tahir Shawl, *pers. comm.* 2003) in Temperate Mixed Broadleaf Forest, especially where there is dense growth of *Parrotia* between 1,800 and 2,700 msl. White-cheeked Tit *Aegithalos leucogenys* is not reported from any IBA but Spectacled Finch *Callacanthus burtoni* is regularly seen in Overa (Price & Jamdar 1990, Price *et al.* 2003). The White-throated Tit *Aegithalos niveogularis* has been regularly seen in Overa Wildlife Sanctuary near the tree line (Price *et al.* 2003). Orange Bullfinch *Pyrrhula aurantiaca* and Kashmir Nuthatch (*Sitta cashmirensis*) are both recorded from Dachigam National Park (Khursheed Ahmad, *unpubl.* 2012). The Orange Bullfinch is regularly seen in Dachigam National Park and Overa-Aru Wildlife Sanctuary in Open

Coniferous and Mixed Forest between 1,600 msl (in winter) and 2,700 to 3,300 msl during summer. Kashmir Nuthatch *Sitta cashmirensis*, though reported only from Overa-Aru (Price & Jamdar 1990) has also been recorded as sighted from a subalpine meadow at c. 3,300 msl in Dachigam (Ahmad 1999, Khursheed Ahmad, *unpubl.* 2003).

Biome 5

Ladakh lies in Biome 5 (Eurasian High Montane – Alpine and Tibetan) where BirdLife International (undated) has identified 48 species that represent the bird assemblages of this biome. Based on the checklist of Pfister (2004), 25 species are found here. In or near the Changthang area, thick stands of *Hippophae rhamnoides* and other vegetation in the Markha and Chang Chu Valleys provide important habitats for large numbers of wintering passerines such as Guldenstadt's Redstart *Phoenicurus erythrogaster*, Common Great Rosefinch *Carpodacus rubicilla*, Streaked Great Rosefinch *C. rubicilloides*, Black-throated Thrush *Turdus ruficollis*, Stoliczka's Tit-warbler *Leptopoecile sophiae*, Robin Accentor *Prunella rubeculoides*, and Brown Accentor *Prunella fulvescens* (Mallon 1987, 1989).

THREATS AND CONSERVATION ISSUES

As elsewhere in the country, heavy human interference and overexploitation of forests has had an adverse impact on wildlife and their habitats. Human-wildlife conflict is a huge problem these days, partly a result of intensive human interference even in protected areas. Thus the victim is wildlife in general, and threatened and endemic species in particular. Among the several Endangered species inhabiting this region is the Hangul, which is now confined to Kashmir. Musk Deer and Markhor, Cheer Pheasant, Western Tragopan, and Black-necked Crane are other Threatened species that require immediate management and conservation actions.

Wildlife conservation in general and Threatened species (particularly Hangul) conservation has been given priority in all management plans, beginning with the first one drafted in 1971 by Collin Holloway. The population of Hangul in Kashmir has been reduced from an estimated 2000 individuals in 1947 to about 140-170 individuals at present (Ahmad *et al.* 2009). Livestock grazing is a major problem in all the protected areas and IBAs in J&K. Even in the prestigious Dachigam NP, a sheep farm is present. Despite repeated attempts, the Wildlife Department has not been successful in relocating this farm outside the national park. Other problems include the lack of coordination between the many different departments that hold stakes in the Park (Animal Husbandry, Hospitality and Protocol, PWD, Irrigation and Water Works, Electricity, Telephones, Agriculture and Fisheries). Disturbance to wildlife is also caused by visitors driving noisily along the 5 km stretch

of road to the VIP lodge at Draphama (Gruisen 1983). At present, the army and paramilitary forces have a base inside the National Park, and they not only occupy the accommodation meant for frontline wildlife staff but also cause disturbance to the Hangul habitats, particularly during its breeding season. Similar is the case with other protected areas and IBAs.

In Gulmarg, the tourist industry depends on the surrounding forest for fuelwood. The forest also suffers, like most sanctuaries of Jammu & Kashmir, from the invasion of nomadic graziers in certain months.

Overa, Lardi, and Dahwattoo villages, with a total human population of nearly 4,500 are situated close to the southern boundary of Overa-Aru WLS. Constant vigil is required to prevent encroachment into the sanctuary (Suhail 2000). The upper parts of this IBA suffer massive grazing pressure during the summer from local and nomadic graziers. Firewood collection is a major problem due to the increase in human population. Many villagers have to stock large amounts of dry wood to see them through winter, though increasingly they are using natural gas. During the dry summer months, forest fire is also an issue. Many times fires are deliberately set by graziers to remove dry, unpalatable, or inedible coarse grasses.

In Ladakh, unplanned developmental activities are the main concern in the Changthang region. Alteration of marshes by willow plantation and construction of roads is directly affecting the breeding grounds of the Vulnerable Black-necked Crane. Increasing settlements near the crane's nesting habitats have resulted in an increase in the feral dog population, a major predator on crane eggs in Changthang.

Overall, the key threats to birds and other biodiversity of the state are habitat encroachment, overgrazing by livestock, tourism, firewood collection, and forest fires.

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CHUSHUL MARSHES

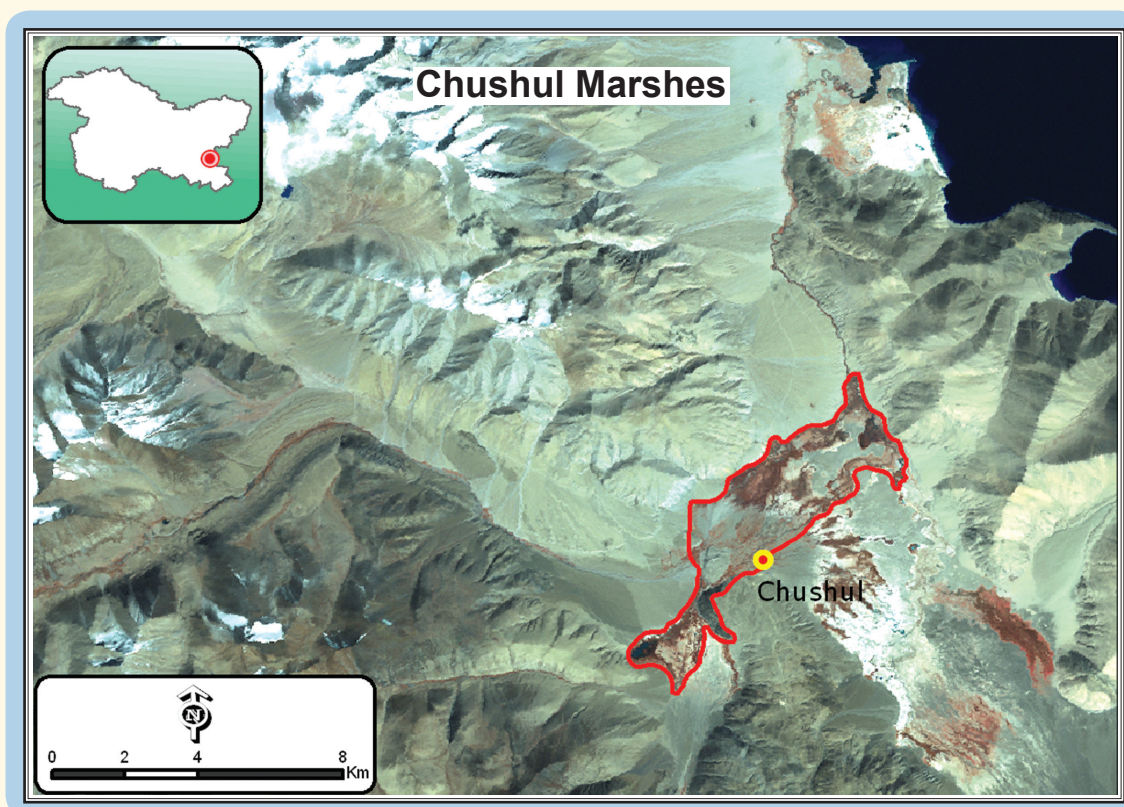
IN-JK-01

IBA Site Code	: IN-JK-01
District	: Leh, Ladakh
Coordinates	: 330 33' 07.6" N, 780 38' 58" E to 350 35' 03" N, 780 45' 00" E
Ownership	: State Wildlife Department
Area	: 1,500 ha

Altitude	: 4,329 msl
Precipitation	: 100 mm + snowfall
Temperature	: -30°C to 30°C
Biogeographic Zone	: Trans-Himalaya
Habitats	: Aquatic: shallow marshes, flooded valley, grassland, plains, wet meadows

IBA CRITERIA : A1 (Threatened Species)

PROTECTION STATUS : Wetland Reserve.



GENERAL DESCRIPTION

The Chushul marshes lie within Changthang, east and west of Chushul village near the India-China border. The habitats consist of shallow ponds, marshes, borax plains, and wet meadows in a broad sandy valley. Springs and streams flowing down into the valley from the Ladakh range create these ponds, pools, and marshes. Some streams terminate on the sandy plains in stagnant pools which become more saline as they evaporate. Others carry enough water to flow into the Pangong Tso. Most of the ponds and marshes remain frozen from December to March. The principal vegetation consists of species of *Hydrilla* and *Myriophyllum* in the ponds, and *Carex*, other

sedges, and grasses in the marsh. The surrounding steppe is dominated by *Caragana*.

AVIFAUNA

The wetland is an important breeding area for several species of waterfowl, such as Ruddy Shelduck *Tadorna ferruginea*, Lesser Sand Plover *Charadrius mongolus*, Common Redshank *Tringa totanus*, and Common Tern *Sterna hirundo*. Three to four pairs of Black-necked Crane *Grus nigricollis* also inhabit the Chushul marshes (Hussain & Pandav 2001; Rauf Zargar, *pers. comm.* 2003; Chandan *et al.* 2006). Some pairs of Bar-headed Goose *Anser indicus* also breed here. During our survey in July 2007, four pairs of



Chushul contains shallow ponds, marshes, borax plains, and wet meadows, thus creating a mosaic of habitats for a large number species

Black-necked Crane were sighted in Chushul marshes and adjoining Tsigul-so and Lung Parma marshes, including two pairs of Black-necked Crane with two chicks each sighted at Tsigul-so and Lung Parma marshes foraging alongside livestock (Khursheed Ahmad, unpubl. 2007). Besides 24 pairs of Bar-headed Geese with 49 chicks, a Golden Eagle *Aquila chrysaetos* was also recorded breeding here. Among other waterbirds, Northern Pintail *Anas acuta*, Redshank *Tringa totanus*, Common Merganser *Mergus merganser*, Ruddy Shelduck *Tadorna ferruginea*, Black Redstart *Phoenicurus ochruros*, and Common Tern *Sterna hirundo* were observed (Khursheed Ahmad, unpubl. 2007). Tibetan Sandgrouse *Syrrhaptes tibetanus* and Tibetan Partridge *Perdix hodgsoniae*, representing Biome 5, occur on the surrounding dry plains.

A species of conservation concern is the Vulnerable Black-necked Crane *Grus nigricollis*.

OTHER KEY FAUNA

The other important fauna include Snow Leopard *Panthera uncia*, Eurasian Lynx *Lynx lynx*, Tibetan Wolf *Canis lupus*, Red Fox *Vulpes vulpes*, Tibetan Sand Fox *Vulpes ferrilata*, Tibetan Wild Ass *Equus kiang*, Tibetan

Argali *Ovis ammon*, Blue Sheep *Pseudois nayaur*, Tibetan Woolly Hare *Lepus oiostolus*, Mountain Weasel *Mustela altaica*, and Himalayan Marmot *Marmota bobak* (Rauf Zargar, pers. comm. 2003; Khursheed Ahmad, unpubl. 2007).

LAND USE

- Urban settlements
- Nature conservation and research
- Agriculture
- Paramilitary (ITBP) establishments

THREATS AND CONSERVATION ISSUES

- Plantation in wetland
- Livestock grazing
- Feral dogs
- Soil erosion

The wetland lies within the proposed High Altitude Cold Desert National Park in east Ladakh. Human interference in the area, including increasing livestock grazing in and around the wetlands, poses a threat to the vegetation and causes soil erosion. Permanent human



DHIRTIMAN MUKHERJEE

Chushul wetland is an important breeding area for several species of water birds

settlements cause contamination of the water, brooks are diverted for agriculture which drains the marshes, and increased garbage production attracts the Raven *Corvus corax* which, together with semi-feral dogs (locally

called Chankhis), prey on small mammals, and eggs and nestlings of waterfowl.

Freshwater marshes are rare in Ladakh, so they are a focal point for humans as well as wildlife. Caragana bushes are collected by the local people to feed livestock and for fuel. During religious festivals, people congregate in these wetlands and there is increased diversion of water channels for domestic use (Rauf Zargar, *pers. comm.* 2003).

KEY CONTRIBUTORS

Rauf Zargar, Bivash Pandav, S.A. Hussain, Khursheed Ahmad, Tsewang Namgail.

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PANKAJ CHANDAN

Golden Eagle *Aquila chrysaetos* breeds in the mountains surrounding Chushul

DACHIGAM NATIONAL PARK

IN-JK-02

IBA Site Code : IN-JK-02

District : Srinagar, Pulwama

Coordinates : 34° 12' 10" N, 74° 51' 36" E

Ownership : State Wildlife Department

Area : 141 sq. km

Altitude : 1,642–4,700 msl

Precipitation : 32–546 mm + snowfall

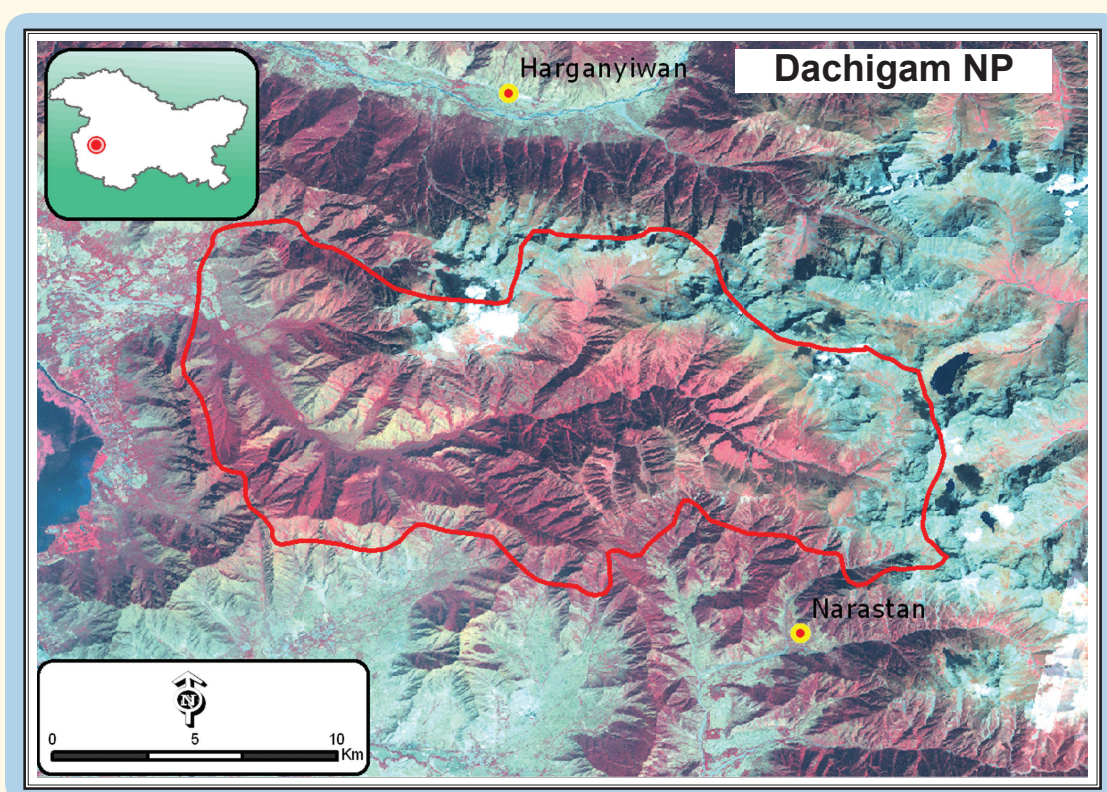
Temperature : -2 °C to 32 °C

Biogeographic Zone : Northwest Himalaya 2A

Habitats : Himalayan Moist Temperate
Mixed Deciduous Forest,
Himalayan Moist Subalpine Mixed
Coniferous Forest,
Himalayan Alpine Moist Scrub,
meadows

IBA CRITERIA : A1 (Threatened Species), A2 (Endemic Bird Area 128: Western Himalaya),
A3 (Biome 5: Eurasian High Montane, Biome 7: Sino-Himalayan Temperate Forest)

PROTECTION STATUS : National Park, established since 1981.



GENERAL DESCRIPTION

Dachigam National Park, about 20 km from Srinagar, was established in 1910 as a hunting reserve by the Maharaja of Kashmir. The importance of Dachigam as a catchment area of Dal Lake was also recognized by the erstwhile Maharaja, who resettled 10 villages to protect the forest cover, hence the name Dachigam (*dachi* = ten, *gam* = village). After the merger of Jammu & Kashmir with India in 1948, the management of the national park was handed over to the erstwhile Game and Fisheries Department and subsequently to the Wildlife Protection Department, which separated from the Forest Department in 1980.

Dachigam National Park lies between 34° 05' 00" N to 34° 10' 32" N, and 74° 53' 50" E to 75° 09' 16" E (Ahmad *et al.* 2009) in the Zaskar mountain range of the Northwest Himalayan biogeographic zone (2A).

It is roughly rectangular, c. 22.5 km long and 8 km wide, and covers half the catchment area of Dal Lake (Holloway & Wani 1971). Dachigam National Park is a part of Zaskar range which forms the northwest branch of the Central Himalayan Axis, bifurcating near Kullu (Himachal Pradesh) and terminating in the high twin peaks of Nun Kun (7,135 msl) (Holloway & Wani 1971). The fold of this mountain range has narrow gullies, and broader outer

ENDANGERED

Egyptian Vulture	<i>Neophron percnopterus</i>
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VULNERABLE

Eastern Imperial Eagle	<i>Aquila heliaca</i>
Kashmir Flycatcher	<i>Ficedula subrubra</i>

ENDEMIC BIRD AREA 128: WESTERN HIMALAYA

Tytler's Leaf-warbler	<i>Phylloscopus tytleri</i>
Kashmir Flycatcher	<i>Ficedula subrubra</i>
Orange Bullfinch	<i>Pyrrhula aurantiaca</i>
Kashmir Nuthatch	<i>Sitta cashmirensis</i>

BIOME 5: EURASIAN HIGH MONTANE (ALPINE AND TIBETAN)

Himalayan Griffon	<i>Gyps himalayensis</i>
Grandala	<i>Grandala coelicolor</i>
Tickell's Leaf-warbler	<i>Phylloscopus affinis</i>
Red-mantled Rosefinch	<i>Carpodacus rhodochlamys</i>
Red-fronted Rosefinch	<i>Carpodacus puniceus</i>
Himalayan Rubythroat	<i>Luscinia pectoralis</i>

BIOME 7: SINO-HIMALAYAN TEMPERATE FOREST

Koklass Pheasant	<i>Pucrasia macrolopha</i>
Himalayan Monal	<i>Lophophorus impejanus</i>
Streaked Laughingthrush	<i>Garrulax lineatus</i>
Variegated Laughingthrush	<i>Garrulax variegatus</i>
Long-billed Bush-warbler	<i>Bradypterus major</i>
Western Crowned Leaf-warbler	<i>Phylloscopus occipitalis</i>
Rusty-tailed Flycatcher	<i>Muscicapa ruficauda</i>
Fire-capped Tit	<i>Cephalopyrus flammiceps</i>
Simla Crested Tit	<i>Parus rufonuchalis</i>
Green-backed Tit	<i>Parus monticolus</i>
Bar-tailed Treecreeper	<i>Certhia himalayana</i>
Yellow-breasted Greenfinch	<i>Carduelis spinoides</i>
Yellow-billed Blue Magpie	<i>Urocissa flavirostris</i>

gullies locally called *nar*. Two steep ridges, one rising near Harwan Reservoir and the other to the east of New Theed, form the natural boundaries of Dachigam NP (Holloway & Wani 1971, Kurt 1978b). Dachigam nurtures a variety of vegetation because of varied habitats, density of dominant species, controlled by diverse microclimatic conditions due to the changing aspects of the undulating terrain, exposure, altitude, and above all, biotic interference.

This park is a major catchment area of the Dal Lake, and a source of drinking water for Srinagar. The Dagwan stream which brings potable water originates from Marsar Lake in Upper Dachigam and is fed by numerous streams (Kurt 1978b) till it drains into Harwan Reservoir.

Dachigam National Park has great ecological, aesthetic, and socio-economic significance. It harbours the last surviving population of the Critically Endangered endemic Kashmir Red Deer or Hangul *Cervus elaphus hanglu*. The Hangul, once distributed widely in the mountains of Kashmir, has declined drastically due to habitat degradation, poaching, and indiscriminate biotic pressure. At present the population numbers 140 to 170 individuals restricted to Dachigam and the adjoining protected areas (Ahmad *et al.* 2009).

Owing to protection for over 90 years, the vegetation of Dachigam NP is in strong contrast with that outside. Despite the pressure of graziers in the park, the vegetation is more or less intact, although invasive species are now seen in some areas. The slopes of Dagwan Valley and the catchment areas of various nullahs in Lower Dachigam sustain almost pristine vegetation. Six major types of vegetation have been recognized. The lower areas, from 1,700 to 3,000 msl, have Broadleaf Mesophyll forests of *Acer caesium*, *Morus alba*,



KHURSHED AHMAD

Dachigam National Park is the sole remaining habitat of Kashmir Stag or Hangul *Cervus elaphus hanglu*



ASAD R. RAHMANI

Owing to its proximity to Srinagar town, Dachigam NP is very popular with tourists and government officials

Ulmus spp., *Rhus succedanea*, *Juglans regia*, *Parrotiopsis jacquemontiana*, and conifers such as Blue Pine *Pinus wallichiana*, Spruce *Picea smithiana*, and Fir *Abies pindrow* growing in altitudinal succession (Holloway 1970). The upper reaches, from 3,000 to c. 4,500 msl, comprise a vegetation gradient of Subalpine forest community followed by scrub Silver Birch *Betula utilis* and Rhododendron *Rhododendron* spp., interspersed with herb-rich grasslands and meadows above 3,300 msl. This gradually merges into the zone of permanent snow, above 4,500 msl (Holloway 1970, Ahmad *et al.* 2009). Habitat gradation is similar to Overa-Aru, but importantly, Dachigam starts at a lower altitude, and is an important location in the Kashmir Valley for several species not found in Overa, including generally common species such as the Yellow-billed Blue Magpie *Urocissa flavirostris*, Grey-hooded Warbler *Phylloscopus xanthoschistos*, and Grey-winged Blackbird *Turdus bouboul* (Trevor Price, *pers. comm.* 2012).

AVIFAUNA

Dachigam NP is rich in high altitude birds. Before insurgency started in 1989, it was very popular with birdwatchers and researchers. Katti (1989) recorded 145 bird species, while Hussain (1989) noted 107 species during the BNHS Bird Migration Project. Many birds were ringed,

and their identity confirmed. Ahmad (1999) recorded 45 bird species in Lower Dachigam, while Mohammad Raashid (unpubl. 2012) has recorded 111 species in the Lower Dachigam area.

This site is important for the globally Vulnerable Kashmir Flycatcher *Ficedula subrubra*, which was observed in Dachigam's Mixed Woodland habitats, dominated by *Rubinia pseudoacacia* (Ahmad 1999). Courtship behaviour was observed by Khursheed Ahmad in 2003 in the mixed woodland habitat near the Sheep Breeding Farm (Khursheed Ahmad, unpubl.). This migratory flycatcher has a small population and breeding range, which is severely fragmented due to the destruction of Temperate Mixed Deciduous Forests (BirdLife International 2001). It has recently been found wintering in moderate numbers in Mukurthi NP (an IBA) in Tamil Nadu (Zarri & Rahmani 2004).

Dachigam lies in Endemic Bird Area 128 (Western Himalaya) where Stattersfield *et al.* (1998) have listed 11 restricted-range species, of which three are found here.

Dachigam represents two biomes: Biome 5 Eurasian High Montane (Alpine and Tibetan), above c. 3,600 msl, and Biome 7 Sino-Himalayan Temperate Forest, between 1,800 and 3,600 msl. According to the BirdLife International (undated) list of biome species, out of 48 Biome 5 species, 7 are found here, and out of 112 Biome 7 species, 13 are found.



DHIRTIMAN MUKHERJEE

Orange Bullfinch *Pyrrhula aurantiaca* is endemic to Western Himalaya

Khursheed Ahmad recorded the migratory Northern Pintail *Anas acuta* and Mallard *Anas platyrhynchos* on June 20, 1998 at Harwan Reservoir inside the park (Ahmad 1999). While there are many records of Mallard breeding in Kashmir (Bates & Lowther 1952), the presence of Northern Pintail in summer so far from its known breeding range is interesting.

Of the pheasants, Himalayan Monal *Lophophorus impejanus* and Koklass *Pucrasia macrolopha* are present. Himalayan Snowcock *Tetraogallus himalayensis* has been reported (Rodgers & Panwar 1988). Other breeding birds include Bullfinch *Pyrrhula aurantiaca* and Tytler's Leaf-warbler *Phylloscopus tytleri*. The White-rumped Vulture *Gyps bengalensis* reported from this IBA during IBA workshop in 2004, hence included in Islam & Rahmani (2004), has not been recorded by most birdwatchers. However, Himalayan Griffon *Gyps himalayensis*, Himalayan Griffon Vulture *Gyps himalayana*, Bearded Vulture or Lammergeier *Gypaetus barbatus*, and Himalayan Golden Eagle *Aquila chrysaetos* are easily seen. The Vulnerable Eastern Imperial Eagle *Aquila heliaca* is seen during the migratory season. Kashmir Nuthatch *Sitta cashmirensis*, Large-spotted Nutcracker *Nucifraga multipunctata*, Rusty-tailed Flycatcher *Muscicapa ruficauda*, Strong-footed (Brown-flanked) Bush-warbler *Cettia fortipes*, Western Crowned Leaf-warbler *Phylloscopus occipitalis*, Variegated Laughingthrush *Garrulax variegatus*, Fire-capped Tit *Cephalopyrus flammiceps*, and Simla Crested Tit *Parus rufonuchalis* are some of the other important birds seen

here. Black-and-Yellow Grosbeak *Mycerobas icteroides* and Chestnut Thrush *Turdus rubrocanus* are also seen during the winter till early spring (Ahmad 1999).

OTHER KEY FAUNA

Apart from the Hangul, Dachigam National Park is home to 15 species of mammals (Ahmad *et al.* 2009).

Himalayan Black Bear *Ursus thibetanus* is widely distributed (Kurt 1979), but the Brown Bear *Ursus arctos* is uncommon, found only in Upper Dachigam (Kurt 1979, Gruisen 1983). Dachigam harbours the maximum density of Himalayan Black Bear in India (Sathyakumar *et al.* 2001). Himalayan Musk Deer *Moschus chrysogaster* and Serow *Naemorhedus sumatraensis* are other uncommon ungulates of the higher reaches of Dachigam. There is no recent record of Snow Leopard *Uncia uncia*, although Holloway (1970) reported seeing one. Leopard *Panthera pardus*, the major natural predator, is quite common. Himalayan Yellow-throated Marten *Martes flavigula*, Beech or Stone Marten *Martes foina*, Himalayan Weasel *Mustela sibirica*, Jungle Cat *Felis chaus*, Golden Jackal *Canis aureus*, and Red Fox *Vulpes vulpes* are some of the smaller predators. Long-tailed Marmot *Marmota caudata* and Himalayan Mouse Hare *Ochotona roylei* and birds are the main prey. Mir Mansoor (*pers. comm.*) recently reported and photographed the Himalayan Wolf *Canis lupus chanco* from the park. Of the seven Langur species described by Groves (2001), Nepal Langur *Semnopithecus schistaceus* is found. It moves around in troops, often of 60 or more (Gruisen 1983). Small Indian Civet *Viverricula indica* was recently recorded in the park. Himalayan Pit Viper *Gloydius himalayanus* is the only poisonous snake commonly seen.

LAND USE

- Nature conservation and research
- Ecotourism and nature education
- Watershed conservation
- Various government organizations (Sheep Breeding Farm, Fisheries Farm), Hospitality & Protocol VVIP Guest House, PHE, Irrigation, Power, Telephone and PWD (R&B) department huts and staff. Above all paramilitary establishments and their dogs

THREATS AND CONSERVATION ISSUES

- Overgrazing
- Unregulated tourism
- Lack of coordination among different departments involved in the national park
- Poaching
- Disturbance due to movement of staff of various departments and paramilitary personnel
- Dogs of paramilitary units

An estimated 10,000 sheep and 5,000 water buffalo belonging to Chopans, Gujjars, Bakarwals, and Banyaris used to graze on the alpine pastures in summer, and wood and grass was collected by local villagers (Kurt 1978a,b, 1979). There are no longer any permanent settlements within the park. Nomadic Gujjars and Bakarwals, however, continue to occupy the Dagwan pastures of Upper Dachigam in summer (Ahmad *et al.* 2009) and grazing is the main problem. The Government-owned Sheep Breeding Farm is also a problem. Though the decision to relocate it outside the park was taken long ago, it has not been implemented. The presence of army and paramilitary forces causes much disturbance due to their movements, always in convoys with escort vehicles.

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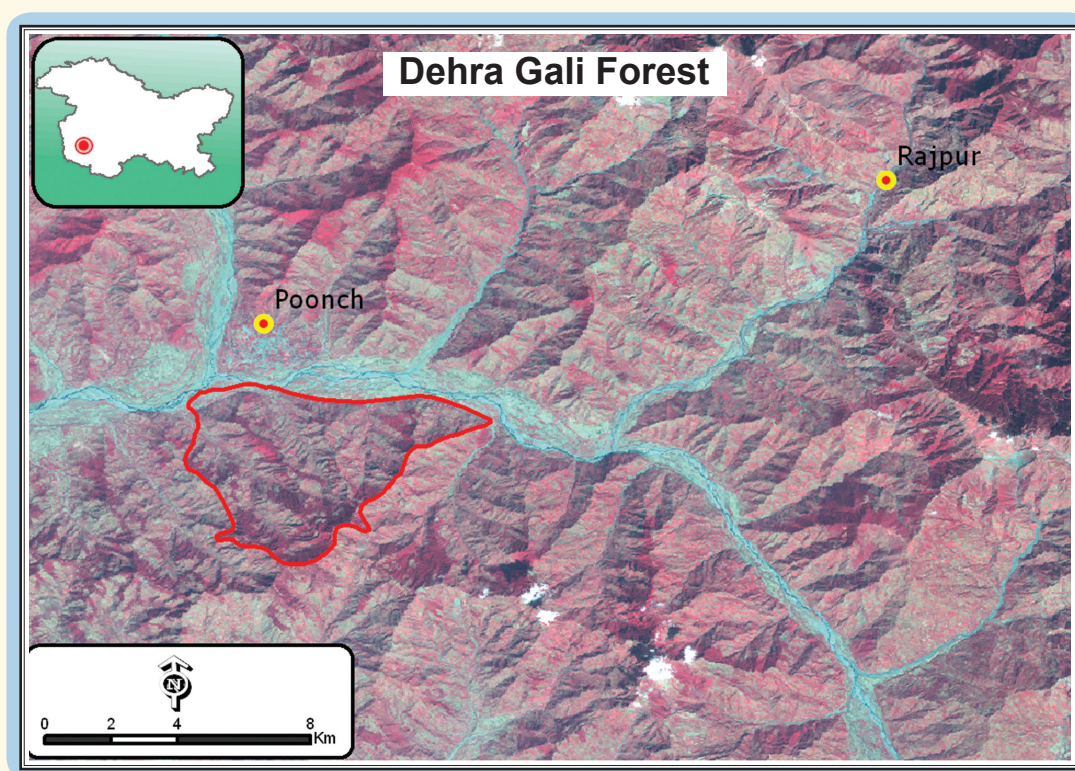
DEHRA GALI FOREST

IN-JK-03

IBA Site Code	: IN-JK-03	Precipitation	: 1,150 mm + snowfall
District	: Poonch, Rajouri	Temperature	: -4 °C to 25 °C
Coordinates	: 33° 34' 00" N, 74° 24' 00" E	Biogeographic Zone	: Himalaya
Area	: 1,800 ha	Habitats	: Himalayan Wet Temperate, Subtropical Pine Forest, Subtropical Broadleaf Forest
Altitude	: 1,650–2,396 msl		

IBA CRITERIA: A1 (Threatened Species), A2 (Endemic Bird Area 128: Western Himalaya)

PROTECTION STATUS: Not officially protected.



GENERAL DESCRIPTION

This IBA site in the foothills of the Pir Panjal Range is located c. 32 km northeast of Rajouri town and 190 km from Jammu city. It lies in the temperate region and experiences heavy snowfall in winter, while summer is moderate. Realising the importance of this site as a key habitat for birds, the Jammu & Kashmir Forest Department is promoting it as a major ecotourism destination.

AVIFAUNA

Not much information on birdlife is available, but as the habitat is still suitable, it could be an excellent IBA (Shawl 1997). Intesar Suhail (*pers. comm.* 2003) spotted the Kashmir Flycatcher *Ficedula subrubra*, a globally Vulnerable species according to BirdLife International

(2001). Another species of special conservation concern is the Western Tragopan *Tragopan melanocephalus*. The Himalayan Monal *Lophophorus impejanus* is also found here, perhaps in considerable numbers.

Some other key species of birds found in **DKG** include Lammergeier *Gypaetus barbatus*, Golden Eagle *Aquila chrysaetos*, Himalayan Griffon *Gyps himalayensis*, Common Kestrel *Falco tinnunculus*, Black-headed Jay *Garrulus lanceolatus*, Oriental Turtle-dove *Streptopelia orientalis*, and Scaly-bellied Woodpecker *Picus squamatus*.

OTHER KEY FAUNA

The area exhibits a rich and diverse faunal composition: Himalayan Black Bear *Ursus thibetanus*, Brown Bear *Ursus arctos*, Himalayan Musk Deer *Moschus chrysogaster*,

IN-JK-03



THAKUR DALIP SINGH

Western Tragopan *Tragopan melanocephalus* is one of the threatened bird species found in Dehra Gali

VULNERABLE

Western Tragopan	<i>Tragopan melanocephalus</i>
Kashmir Flycatcher	<i>Ficedula subrubra</i>

ENDEMIC BIRD AREA 128: WESTERN HIMALAYA

Western Tragopan	<i>Tragopan melanocephalus</i>
Kashmir Flycatcher	<i>Ficedula subrubra</i>

Leopard *Panthera pardus*, Himalayan Yellow-throated Marten *Martes flavigula*, Beech or Stone Marten *Martes foina*, Himalayan Weasel *Mustela sibirica*, Jungle Cat *Felis chaus*, Golden Jackal *Canis aureus*, Red Fox *Vulpes vulpes*, Long-tailed Marmot *Marmota caudata*, and Himalayan Mouse Hare *Ochotona roylei*.

LAND USE

- Agriculture
- Tourism
- Grazing

THREATS AND CONSERVATION ISSUES

- Illegal felling

- Grazing
- Poaching
- Encroachment

One the major threats to the biodiversity of the area which has emerged in recent times is increasing vehicular traffic on the road passing through the forest. This is because of the road being a link to the historic Mughal Road connecting Jammu with Kashmir Valley.

The other major threats to this area are unplanned and unregulated developmental activities, overgrazing, illicit cutting of trees, poaching, and encroachment.

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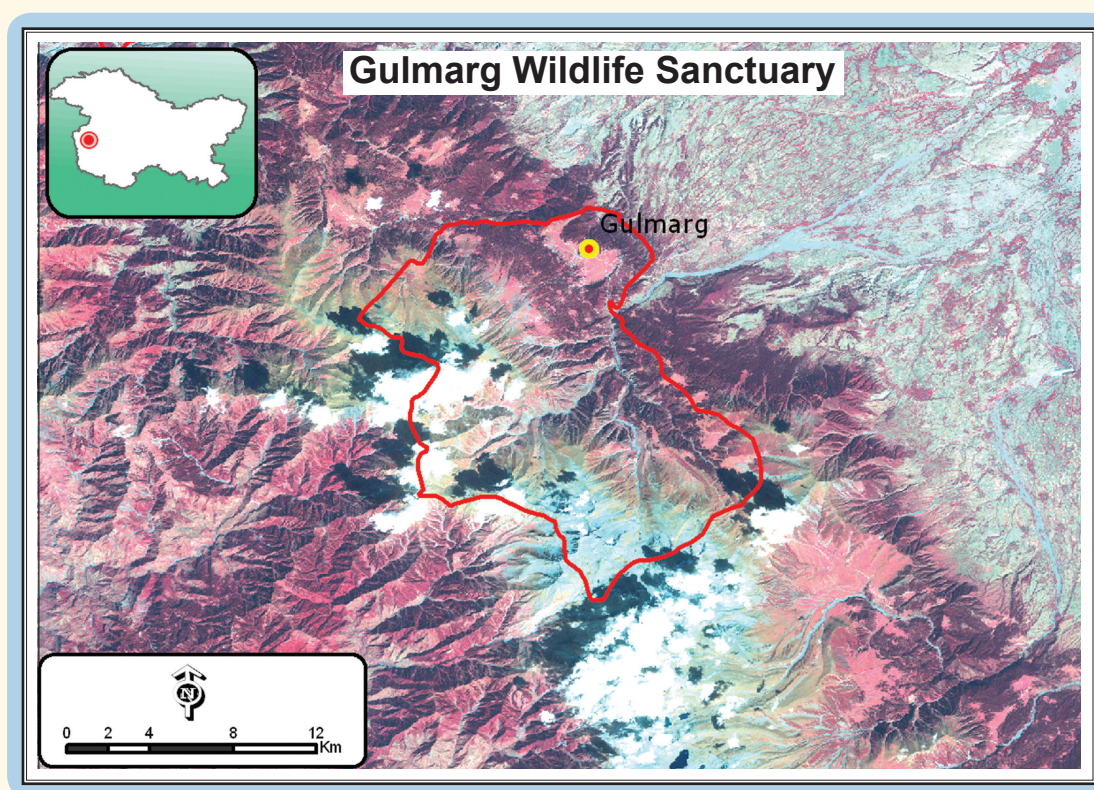
GULMARG WILDLIFE SANCTUARY

IBA Site Code	: IN-JK-04	Annual Snowfall	: > 14 m
District	: Baramulla	Temperature	: -8° C to 37 °C
Coordinates	: 34° 15' 48" N, 74° 13' 23" E	Biogeographic Zone	: Himalaya
Ownership	: State	Habitats	: Himalayan Wet Temperate,
Area	: 13,925 ha		Alpine Moist Scrub,
Altitude	: 2,400–4,300 msl		Alpine Moist Pasture

IN-JK-04

IBA CRITERIA: A1 (Threatened Species), A2 (Endemic Bird Area 128: Western Himalaya), A3 (Biome 5: Eurasian High Montane, Biome 7: Sino-Himalayan Temperate Forest)

PROTECTION STATUS: Wildlife Sanctuary, established in March 1987.



GENERAL DESCRIPTION

As the name indicates, the sanctuary surrounds the famous tourist resort of Gulmarg. It was proposed to be declared a biosphere reserve in 1981, which did not work out, but the Department of Wildlife Protection declared it a sanctuary in 1987. The Gulmarg Sanctuary lies on the northeast side of the Pir Panjal range, c. 50 km southwest of Srinagar. It encompasses the upper catchment area of Ferozpur Nullah and the forests that surround the Gulmarg meadows. It is bounded to the north by Jhelum Valley Forest Division, to the south and west by Poonch and Pir Panjal Forest Divisions, and to the east by Drang village. The terrain is steep, becoming precipitous in the upper reaches

of Ferozpur Nullah. The underlying rocks are predominantly Panjal volcanics, with well exposed acidic lava flows. Shale, limestone, slate, and quartzite occur throughout the tract (Anon. 1987, Bacha 2002a).

Gulmarg Wildlife Sanctuary consists of Subalpine Forests of Blue Pine *Pinus wallichiana*, Silver Birch *Betula utilis*, and Silver Fir *Abies pindrow*. Blue Pine forest is dominated by *Pinus wallichiana*, mixed at places with stands of Spruce *Picea smithiana*, West Himalayan Yew *Taxus contorta*, and Maple *Acer cappadocicum*. This type of forest occurs mainly at lower altitudes on dry aspects of the slopes (Bacha 2002). Silver Fir is restricted to mountain folds and moist aspects. At lower levels, it is associated at some places with *Pinus*

wallichiana, *Taxus contorta*, and *Picea smithiana*. Birch extends from 3,000 to 3,500 msl, and is distributed in the mountain folds and shady sites bordering alpine slopes. At lower altitudes, the forest has stands of Silver Fir (Bacha 2002).

The alpine meadows in and around Gulmarg have mainly herbaceous vegetation, with *Inula*, *Primula*, *Potentilla*, *Corydalis*, *Gentiana*, *Rumex*, and *Polygonum*. The meadows were planted with many introduced bulbous species like iris, narcissus, daffodils, jonquils, and lupins, which have become naturalized.

AVIFAUNA

There is no recent checklist of this site. According to Trevor Price (*pers. comm.* 2012) the bird list is likely to be similar to Overa-Aru and the upper reaches of Dachigam. The official list (Anon. 1987) needs to be confirmed. Osmaston (1923) recorded 76 species from Gulmarg area. Based on this old checklist, 14 species of Biome 7 (Sino-Himalayan Temperate Forest) and four of Biome 5 (Eurasian High Montane – Alpine and Tibetan) are found here. Among the threatened species, only Kashmir Flycatcher *Ficedula subrubra* is confirmed.

Himalayan Snowcock *Tetraogallus himalayensis* is regularly seen. Himalayan Monal *Lophophorus impejanus* and Koklass Pheasant *Pucrasia macrolopha* have been recorded (Ifshan Dewan & M.S. Bacha, *pers. comm.* 2003).

BIOME 5: EURASIAN HIGH MONTANE

Himalayan Griffon	<i>Gyps himalayensis</i>
Himalayan Snowcock	<i>Tetraogallus himalayensis</i>
Ibisbill	<i>Ibidorhyncha struthersii</i>
Tickell's Leaf-warbler	<i>Phylloscopus affinis</i>

BIOME 7: SINO-HIMALAYAN TEMPERATE FOREST

Himalayan Monal	<i>Lophophorus impejanus</i>
Koklass Pheasant	<i>Pucrasia macrolopha</i>
Himalayan Pied Woodpecker	<i>Dendrocopos himalayensis</i>
Himalayan Rubythroat	<i>Luscinia pectoralis</i>
Indian Blue Robin	<i>Luscinia brunnea</i>
Streaked Laughingthrush	<i>Garrulax lineatus</i>
Variegated Laughingthrush	<i>Garrulax variegatus</i>
Large-billed Leaf-warbler	<i>Phylloscopus magnirostris</i>
Western Crowned-warbler	<i>Phylloscopus occipitalis</i>
Simla Crested Tit	<i>Parus rufonuchalis</i>
Spot-winged Crested Tit	<i>Parus melanolophus</i>
Green-backed Tit	<i>Parus monticola</i>
White-cheeked Nuthatch	<i>Sitta leucopsis</i>
Bar-tailed Tree-creeper	<i>Certhia himalayensis</i>

OTHER KEY FAUNA

Large mammals recorded during a brief survey in 1979 include Rhesus Macaque *Macaca mulatta*, Brown Bear *Ursus arctos*, Himalayan Black Bear *Ursus thibetanus*, Red Fox *Vulpes vulpes*, Leopard *Panthera pardus*, and Himalayan Musk Deer *Moschus chrysogaster* (Green 1979,



Ibisbill *Ibidorhyncha struthersii* is threatened by unregulated tourism in its habitat

ANANT ZANJALE

1986). According to the Department of Wildlife Protection (Bacha 2002) Markhor *Capra falconeri* is also found in this sanctuary.

LAND USE

- Tourism and recreation
- Nature conservation and research
- Pasture/Grazing land

THREATS AND CONSERVATION ISSUES

- Unregulated tourism
- Excessive livestock grazing
- Cable car
- Proposed amusement park
- Collection of fuelwood

The Gulmarg tourist industry depends on the surrounding forest for fuel wood. The forests and lush green meadows, as in other protected areas of Jammu & Kashmir, suffer heavily from invasion of nomadic graziers during May to September.

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The Common Rosefinch is seen in large numbers in Gulmarg

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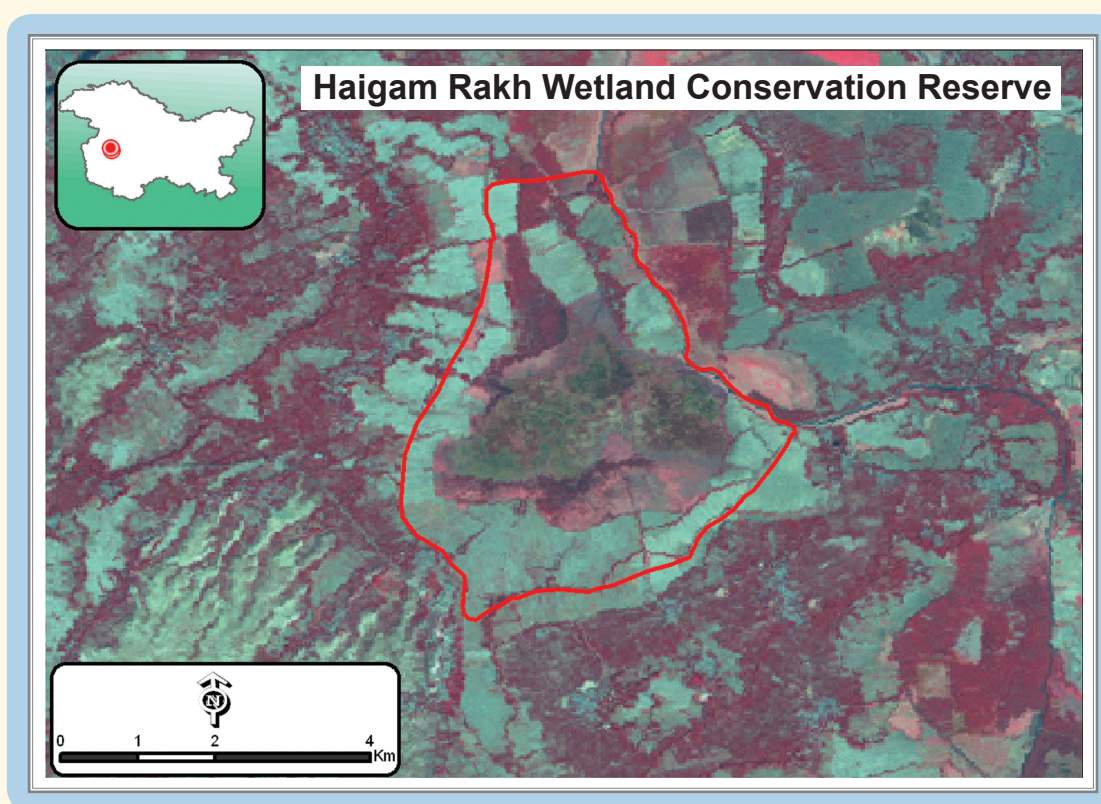
HAIGAM RAKH WETLAND CONSERVATION RESERVE

IN-JK-05

IBA Site Code	: IN-JK-05	Precipitation	: 900 mm + snowfall
District	: Baramulla	Temperature	: -2° C to 30° C
Coordinates	: 34° 17' 15" N, 74° 35' 46" E	Biogeographic Zone	: Himalaya
Ownership	: State Wildlife Department	Habitats	: Aquatic,
Area	: 14 sq. km		Riverine Vegetation,
Altitude	: 1,580 msl		Himalayan Secondary Scrub

IBA CRITERIA: A1 (Threatened Species), A4iii (> 20,000 Waterbirds)

PROTECTION STATUS: Wetland Conservation Reserve.



GENERAL DESCRIPTION

Haigam Rakh is named after village Haigam, and is situated c. 40 km from Srinagar. It was notified as a game reserve for duck shooting as far back as 1945. Earlier, the area was c. 14 sq. km, with 4 sq. km of reedbeds (Holmes & Parr 1988), but now the total size of the reserve including the reedbeds has shrunk to 7.25 sq. km.

Haigam Rakh (marsh) is a permanent shallow freshwater lake with a maximum depth of 1.25 m, located in the Jhelum Valley at the southern end of Lake Wular. Perennial streams feed it, but the water table falls in late summer, reaches its lowest in autumn, and rises again in early winter. Dissolved oxygen can reach very low levels in summer. The surrounding

area is predominantly paddyfields and marshes with some fallow pastures that get flooded after heavy rain.

Most of the lake is covered with dense reeds and other emergent vegetation. Dominant species include *Typha angustata*, *Phragmites communis*, *Phalaris arundinacea*, *Sparganium erectum*, *S. ramosum*, *Scirpus lacustris*, and *S. palustris* (Kaul *et al.* 1980, Kaul 1982). In open areas there is floating vegetation such as Water Lilies *Nymphaea stellata* and *N. alba*, Fringed Water Lily *Nymphoides peltata*, and Water Chestnut *Trapa natans* (Kaul *et al.* 1980). The vegetation is rooted in the bottom of shallower areas or on floating mats of roots and silt (Holmes & Parr 1988). 183 species of phytoplankton have been recorded. Rows of willow

have been planted recently on the edges of the lake, which is surrounded by paddyfields, orchards, and moist pasture.

AVIFAUNA

Haigam Rakh is the largest remaining reedbed area in the Kashmir Valley and is of major ornithological importance (Holmes & Parr 1988). It is particularly important for migratory species and marshland breeding species. Densities of the Little Bittern *Ixobrychus minutus*, Water Rail *Rallus aquaticus*, Common Kingfisher *Alcedo atthis*, and the Clamorous Reed-warbler *Acrocephalus [stentoreus] brunnescens* are particularly high (Holmes & Parr 1988, Holmes & Hatchwell 1991). The area is important for autumn migrants, with 45% of the species recorded being passage migrants and/or winter visitors.

Haigam Lake is a major wintering area for migratory ducks, particularly Common Teal *Anas crecca*, Northern Pintail *A. acuta*, Eurasian Wigeon *A. penelope*, Mallard *A. platyrhynchos*, Gadwall *A. strepera*, Northern Shoveller *A. clypeata*, and Common Pochard *Aythya ferina*. It is also a vital breeding area for numerous species such as Little Grebe *Tachybaptus ruficollis*, Little Bittern *Ixobrychus minutus*, Little Egret *Egretta garzetta*, Water Rail *Rallus aquaticus*, Common Moorhen *Gallinula chloropus*, Pheasant-tailed Jacana *Hydrophasianus chirurgus*, and Whiskered Tern *Chlidonias hybridus*. Large numbers of hirundines and wagtails use the reedbeds for roosting and moulting. During the recent BNHS-MoEF Avian Influenza monitoring and surveillance study (2005–2007), Khursheed Ahmad recorded a considerable population of White Wagtail *Motacilla alba* (794), Yellow Wagtail *M. flava* (790), Citrine Wagtail *M. citreola* (159), and Grey Wagtail *Motacilla cinerea* (40). The wetland is crucial for long distance migrants as a stopover

VULNERABLE	
Pallas's Fish-eagle	<i>Haliaeetus leucoryphus</i>
NEAR THREATENED	
Ferruginous Pochard	<i>Aythya nyroca</i>

site for feeding and resting.

Many waterbirds occur in huge numbers, much above their 1% population threshold determined by Wetlands International (2006). More recent records are available of surveys conducted by Khursheed Ahmad (2005–2007) under the BNHS-MoEF Project on “Surveillance and Monitoring of Avian Influenza in Wintering Birds of India” (Rahmani *et al.* 2008). Based on published information (Scott 1989), the following species occur much above their 1% biogeographic population (total seen in Haigam : 1% threshold numbers): *Anas crecca* (7,000 : 4,000), *A. platyrhynchos* (25,000 : 750), *A. penelope* (3,000 : 2,500), *A. querquedula* (4,000 : 2,500) and *A. strepera* (4,000 : 1,500).

Holmes & Parr (1988) also found that the very local Swinhoe’s Reed-warbler *Acrocephalus concinens* (Blunt-winged Warbler of Grimmett *et al.* 1999) breeds in Haigam Rakh in small numbers, often near isolated willow trees. They found about 10 territories and fledged young ones in July-August 1983.

Historically, Bates & Lowther (1952) recorded breeding of the Ferruginous Duck *Aythya nyroca* in the smaller vales of Kashmir, particularly at Haigam, but Holmes & Parr (1988) found no evidence of its breeding.

During the BNHS-MoEF Avian Influenza study (2005–2007) Khursheed Ahmad recorded huge congregations of species such as Northern Pintail (9,524), Eurasian Wigeon (1,587), Mallard (9,937), Gadwall (7,937), Northern Shoveller



Since shooting was stopped in 1995–96, there has been steady increase in the population of waterfowl

IN-JK-05

INTESAR SUHAIL

(15,000), Common Teal (15,000), Red-crested Pochard (3,000) and Common Pochard (12,700) in Haigam Reserve. These were highest during February (Rahmani *et al.* 2008). Khursheed Ahmad also reported sighting of Western Marsh Harrier *Circus aeruginosus* (8 individuals), Osprey *Pandion haliaetus* (2), and Peregrine Falcon *Falco peregrinus* (2) during the same study (Rahmani *et al.* 2008).

Haigam provides a vital staging area for many passage migrants including at least 18 species of shorebirds and several trans-Himalayan passage migrants. Pallas's Fish-eagle *Haliaeetus leucoryphus* has not been seen in the last 10 years (M.S. Bacha, *pers. comm.* 2003), although Scott (1989) had reported up to five resident individuals.

Since shooting was stopped in 1995–1996, a steady increase in waterfowl and other avian populations is seen at Haigam Rakh. The annual official waterfowl count indicates that total bird counts increased from a mere 1,530 birds recorded in 1996 to 169,305 birds in 1998, and 380,165 birds in 2002 (Bacha 2002). In February 2012, a total of 350,000 birds were recorded in Haigam Wetland Reserve (Rauf Zargar, *pers. comm.* 2012) Even if these figures are excessive, there is no doubt that Haigam Rakh easily qualifies for A4iii criteria.

OTHER KEY FAUNA

Mammals include Common Otter *Lutra lutra* and Golden Jackal *Canis aureus*. The lake also supports a rich fish fauna.

LAND USE

- Agriculture
- Water management
- Nature conservation and research
- Encroachment by locals

THREATS AND CONSERVATION ISSUES

- Siltation
- Agricultural intensification and expansion in surrounding areas
- Urbanization

Haigam Rakh is protected as a conservation reserve by the J&K Department of Wildlife Protection. Reed cutting is permitted, but the ban on hunting of waterfowl since 1995–1996 has led to a marked increase in waterfowl populations.

The principal threats are siltation, encroachment due to agriculture, and urbanization. Encroachers have now been evicted. Steps are being taken by the Wildlife Department to control eutrophication and weed infestation. Facilities are being built for tourists and birdwatchers. The State Government has asked the Central Government to include Haigam Rakh in the National Wetland Conservation Programme.

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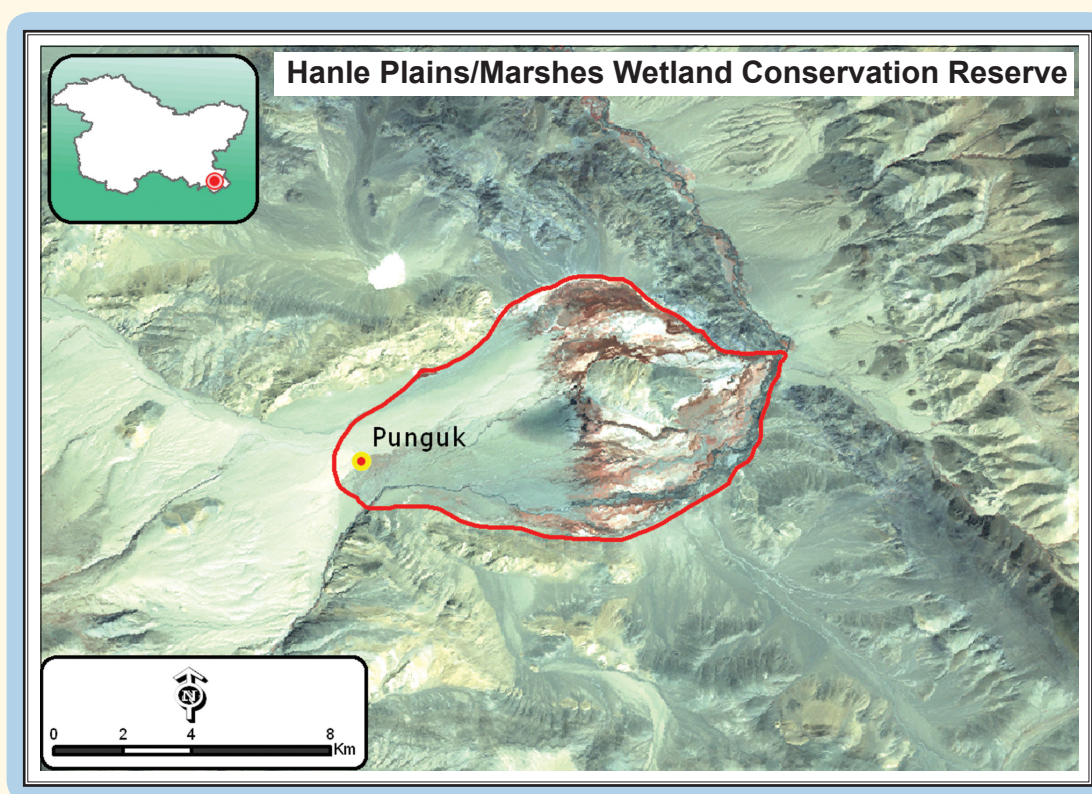
HANLE PLAINS/MARSHES WETLAND CONSERVATION RESERVE

IN-JK-06

IBA Site Code	: IN-JK-06	Temperature	: -40 °C to 30 °C
District	: Leh, Ladakh	Biogeographic Zone	: Trans-Himalaya
Coordinates	: 32° 47' 60" N, 79° 00' 00" E	Habitats	: Riverine Vegetation, Sandy Floodplains, Cold Desert Grasslands Alpine Moist Pasture, Salty Marshes, Freshwater Pools
Ownership	: State/Private		
Area	: 8,000 ha		
Altitude	: 4,250–4,350 msl		
Precipitation	: 100 mm + snowfall		

IBA CRITERIA: A1 (Threatened Species)

PROTECTION STATUS: Wetland is part of the Changthang Cold Desert Wildlife Sanctuary, also declared a Wetland Conservation Reserve by the Department of Wildlife Protection, J&K Government.



GENERAL DESCRIPTION

These marshes are located west and north of Hanle village in Ladakh, near the border with China. They are partly state owned and partly under the Hanle Buddhist monastery. The habitat is a complex of fast flowing streams, stagnant pools, saline marshes, seasonally flooded marshes, and bogs along the River Hanle, 45 km south of its confluence with the Indus. The wetland marshes are frozen from December to March and are fed by snowmelt in summer.

The freshwater pools shelter vegetation such as *Hydrilla*, *Myriophyllum*, *Potamogeton*, and an edible aquatic lichen. Islam & Rahmani (2008) have suggested that Hanle

Marshes be declared as a Ramsar Site as they fulfill Ramsar Criteria 2.

AVIFAUNA

The IBA is an important breeding ground for various waterfowl, including the Black-necked Crane *Grus nigricollis*, Ruddy Shelduck *Tadorna ferruginea*, Lesser Sand Plover *Charadrius mongolus*, and Redshank *Tringa totanus*. Three pairs of Black-necked Crane regularly breed in the Hanle Marshes and one in Lal Pahadi about 22 km from Hanle (Chandan *et al.* 2006). During our recent surveys in 2013, five breeding pairs of Black-necked Crane were

recorded in the Hanle Marshes and adjoining Lal Pahadi areas of Hanle (Chandan 2014). A pair of Redshank with a chick was also sighted in a marsh at Tashi Chholing. Subsequently, in June 2008, only one Black-necked Crane was sighted incubating an egg in a marshy pool at Lal Pahadi area of Hanle (Khursheed Ahmad, unpubl. 2008). During autumn migration many birds pass through this site, including the globally Threatened Greater Spotted-eagle *Aquila clanga*. It uses the plain as the last staging site before crossing the Himalayan range (Pfister 2001). Upland Buzzard *Buteo hemilasius* also breeds in this area (Naoroji 2007).

OTHER KEY FAUNA

Hanle supports several wild cat species like the Snow Leopard *Panthera uncia*, Eurasian Lynx *Lynx lynx* and the Pallas's Cat *Otocolobus manul*. The slopes above Hanle Plains are an important habitat of the Tibetan Gazelle *Procapra picticaudata*. In 1995–1996, the first Tibetan Gazelle was seen here after 35 years of assumed local extinction. The sandy floodplains and riverine habitats of Hanle support a large population of Tibetan Wild Ass or Kiang *Equus kiang*. Tibetan Wolf *Canis lupus chanco* and Red Fox *Vulpes vulpes* are also found. The Tibetan Sand Fox *Vulpes ferrilata* was first recorded here in 2005 (Namgail *et al.* 2005). Besides, Mountain Weasel *Mustela altaica*, Blue Sheep or Bharal *Pseudois nayaur*, Himalayan Marmot *Marmota bobak*, Tibetan Woolly Hare *Lepus oiostolus*, Plateau Pika *Ochotona curzoniae*, and Silvery Mountain Vole *Alticola argentatus* are commonly found. Tibetan Argali was sighted here in 2005 after a gap of about 20 years (Tsewang Namgail, *pers. comm.* 2014).

VULNERABLE

Greater Spotted-eagle	<i>Aquila clanga</i>
Black-necked Crane	<i>Grus nigricollis</i>

LAND USE

- Water management
- Local recreation (no tourist permit is issued for this area)
- Grazing land
- Agriculture
- High Altitude Astrophysics Observatory
- ITBP posts

THREATS AND CONSERVATION ISSUES

- Disturbance to birds from anthropogenic sources
- Excessive livestock grazing competing with wild herbivores
- Unplanned development and infrastructure
- Plantation in the wetland
- Wetland reclamation for agriculture
- Diversion of water for agriculture

The area is used for grazing domestic livestock and for water supply to the various hamlets in the Hanle river basin. The human population in the valley is increasing, and correspondingly the livestock population, intensifying grazing pressure and use of water for high altitude agriculture. Packs of semi-feral dogs roam the region, taking a heavy toll on small mammals and nestlings, including unfledged Black-necked Crane. The dog numbers should be controlled, if the Black-necked Crane is to be saved.



The wetland marshes are frozen from December to March and are fed by snowmelt in summer

DHIRTIMAN MUKHERJEE



YESHEY DORJI

The marshes of the Hanle Plains are one of the most important nesting sites of Black-necked Crane *Grus nigricollis*

Various parts of the marshes have been fenced for large-scale plantation of Willow under the supervision of the Forest Department. With the increasing influx of Tibetan refugees, their camps are growing bigger. Regular practice firing by the army and Indo-Tibetan Border Police disturbs the tranquillity of the site (A.K. Srivastava, *pers. comm.* 2000).

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HEMIS HIGH ALTITUDE NATIONAL PARK

IN-JK-07

IBA Site Code : IN-JK-07

District : Ladakh

Coordinates : 34° 01' 11" N, 77° 32' 00" E

Ownership : State Wildlife Department

Area : 410,000 ha

Altitude : 3,140–5,854 msl

Precipitation : 110 mm + snowfall

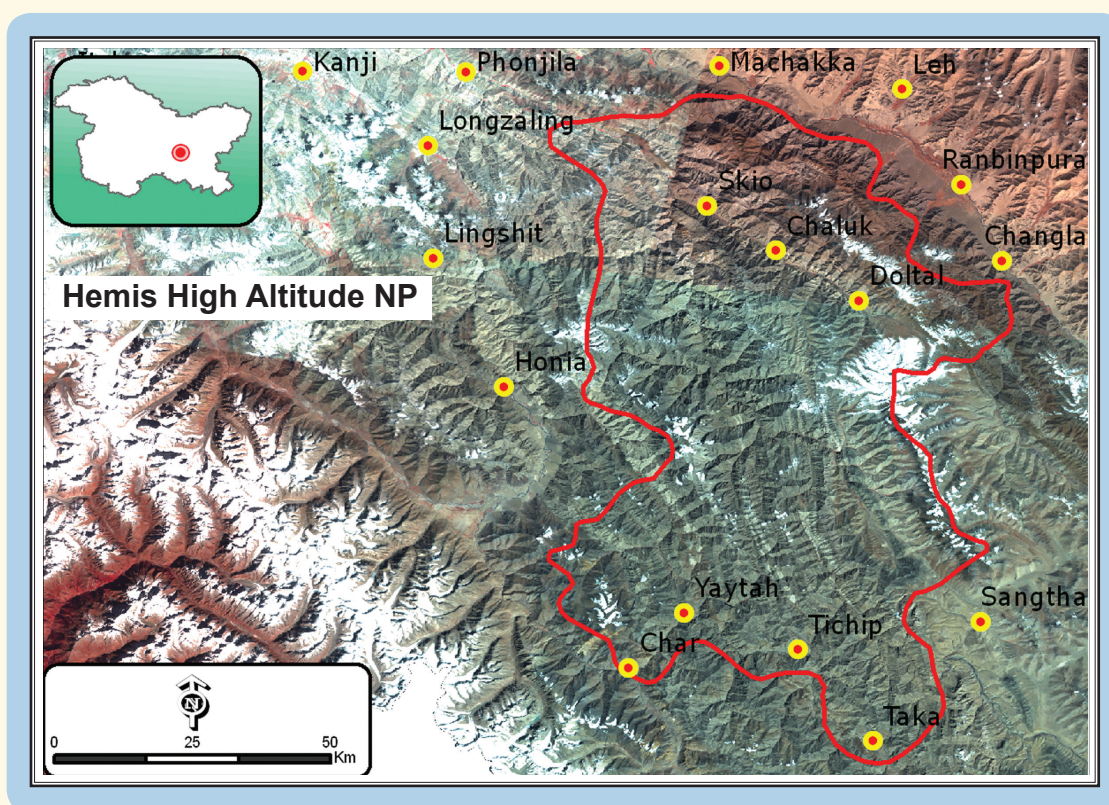
Temperature : -40 °C to 35 °C

Biogeographic Zone : Trans-Himalaya

Habitats : Alpine Dry Pasture,
Riverine Vegetation, Alpine Moist
Scrub, Rocky Cliffs

IBA CRITERIA: A3 (Biome 5: Eurasian High Montane)

PROTECTION STATUS: National Park, established in February 1981.



GENERAL DESCRIPTION

Hemis National Park is located in the Trans-Himalayan region of Ladakh on the south bank of the Indus river. It extends from the southern side of the Indus Valley, southwards across the Zaskar range as far as the Tsarap Chu and eastwards to the Hemis Monastery, which the national park is named after. The Markha and Rumbak Valleys and River Zaskar are located within the park.

The present area of the park is 410,000 ha, comprising a 125,000 ha core area and 285,000 ha buffer zone. Further extension of 65,000 ha has been recommended (Mallon & Bacha 1989).

Hemis is a wholly mountainous area. The core area (Alam Nullah and lower Chang Chu) lies in a band of hard

limestone and other sediments that have been raised and tilted almost vertically, and deeply incised by a series of gorges. The terrain is extremely rugged with cliffs, screes, and exposed rock. It is isolated, with only a few passes crossing the main watersheds. The Markha and adjacent Sumdah Blocks comprise the catchment areas of the Markha, Rumbak, Shang, and Sumdah rivers, all of which drain north into the Indus. The area covered by these two blocks consists of narrow valleys and gorges. Gently sloping alluvial fans form a short section of stone desert along the south bank of the Indus between its confluences with the Zaskar and Rumbak. The upper Chang Chu (or Kharnak) Block lies above 4,000 msl. Here the landscape is different from the rest of the park, and typical of the eastern plateau of



DHRITIMAN MUKHERJEE

The terrain of this National Park is extremely rugged and consist of valleys and gorges

Ladakh. This broad valley has a level floor up to 1 km wide, bounded by hills with relatively few cliffs. Shun-Shadey, which encompasses the Niri Chu and Shun catchment, is a remote and sparsely inhabited block lying above 3,800 msl. Its terrain is exceptionally rugged, with deep gorges, cliffs, and steep, broken slopes. There are two small lakes, unusual features in the mountains of central Ladakh (Mallon & Bacha 1989).

Hemis is the largest protected area in the Indian Himalaya. Its large size and altitudinal range ensure that it is fully representative of the Trans-Himalayan ecosystem of central Ladakh. Important features are the remnant patches of Juniper scrub and riverine woodland, Snow Leopard *Panthera uncia* and associated prey populations, with an uninhabited and little-disturbed core area (Mallon & Bacha 1989). This PA has been selected as one of the several Snow Leopard Reserves under Project Snow Leopard by the Government of India, to conserve this rare species, its prey populations and its fragile montane habitat (Ministry of Environment and Forests 1988).

Much of central Ladakh is high altitude desert (Dhar & Kachroo 1983) characterized by sparse grassland and herbaceous vegetation on mountain slopes, with shrubs and patchy forest at the base of the valleys. The vegetation of the park is described by Mallon & Bacha (1989) and by Fox *et al.* (1986).

BIOME 5: EURASIAN HIGH MONTANE

Himalayan Griffon	<i>Gyps himalayensis</i>
Himalayan Snowcock	<i>Tetraogallus himalayensis</i>
Tibetan Partridge	<i>Perdix hodgsoniae</i>
Ibisbill	<i>Ibidorhyncha struthersii</i>
Brown-headed Gull	<i>Larus brunnicephalus</i>
Tibetan Sandgrouse	<i>Syrhaptes tibetanus</i>
Snow Pigeon	<i>Columba leuconota</i>
Grey-backed Shrike	<i>Lanius tephronotus</i>
Robin Accentor	<i>Prunella rubeculoides</i>
Brown Accentor	<i>Prunella fulvescens</i>
Guldenstadt's Redstart	<i>Phoenicurus erythrogaster</i>
Stoliczka's Tit-warbler	<i>Leptopoeile sophiae</i>
Red-mantled Rosefinch	<i>Carpodacus rhodochlamys</i>
Streaked Great Rosefinch	<i>Carpodacus rubicilloides</i>
Common Great Rosefinch	<i>Carpodacus rubicilla</i>
Yellow-billed Chough	<i>Pyrrhocorax graculus</i>

Trees are sparse, isolated, or in small open assemblies on hill slopes, and thin strips of riverine woods are common with the rest of Ladakh. The core area and the proposed Zaskar Gorge Block contain some of the best extant fragments of juniper forest steppe formerly common to many parts of Central Asia. Characteristic species are *Juniperus macropoda* and *J. indica*, which are scattered on cliffs and high slopes up to 4,250 msl, and form patches of open scrub

in a few localities. Thin strips of riverine woodland are most extensive in the Chang Chu catchment. The principal species are *Salix karelinii* and *Myricaria squamosa*, with a few Poplar *Populus euphratica*, Silver Birch *Betula utilis*, and Willow *Salix* spp. The vegetation thins out above 4,500 msl, with a few alpine species persisting to 5,000 msl and above. Chundawat (1990) gave a list of 314 plant species recorded in the catchment of Rumbak Nullah.

AVIFAUNA

Many high altitude birds of the Western Himalaya are found in Hemis NP, 80 species having been recorded till date, of which about 50 breed in the Park. The Park does not have any globally Threatened or restricted-range species, but many Biome 5 (Eurasian High Montane – Alpine and Tibetan) species have been recorded. Hemis is perhaps the best representative of Biome 5 in India [PLEASE CONFIRM ADDITION].

Thick stands of *Hippophae rhamnoides* and other vegetation in the Markha and Chang Chu Valleys provide important habitats for large numbers of wintering passerines such as Guldenstadt's Redstart *Phoenicurus erythrogaster*, Great Rosefinch *Carpodacus rubicilla*, Streaked Great Rosefinch *C. rubicilloides*, Black-throated Thrush *Turdus ruficollis*, Stoliczka's Tit-warbler *Leptopoeile sophiae*, Robin Accentor *Prunella rubeculoides*, and Brown Accentor *Prunella fulvescens* (Mallon & Bacha 1989).

Unusual passage migrants include first records in Ladakh of Southern Grey Shrike *Lanius meridionalis*, Spotted Flycatcher *Muscicapa striata*, and Orange-flanked Bush Robin *Tarsiger cyanurus*. There are no extensive wetlands in the park, but a few species of duck have been seen on the Zaskar river in spring, and migrating Common Teal *Anas crecca* in the Markha and Chu Valleys (Mallon & Bacha 1989). Khursheed Ahmad, while participating in a week long Workshop conducted by the International Snow Leopard Trust (ISLT) in October 1999 in Rumbak and Markha Valley of Hemis, besides recording all the above named species in the Markha Valley also sighted Bearded Vulture or Lammergeier *Gypaetus barbatus*, Yellow-billed Chough *Pyrrhocorax graculus*, and Red-billed Chough *Pyrrhocorax pyrrhocorax*.

OTHER KEY FAUNA

Hemis NP is famous for its population of the Snow Leopard *Panthera uncia* which is relatively high-density, especially in the core area. The total population is estimated at 75 to 120 individuals, being most numerous in the Chang Chu catchment of the core area, mainly because its prey population is also high. Bharal or Blue Sheep *Pseudois nayaur* is present (1.3 animals per sq. km) in some valleys. The total population of this prey species is estimated at 2,600 to 5,000. The Ladakh Urial *Ovis vignei* is restricted



DHIRTIMAN MUKHERJEE

Bearded Vulture *Gypaetus barbatus* is one of the largest birds of Hemis NP

to the northern part of the park, where 226 individuals were recorded in 1984. An isolated herd of 20–22 Tibetan Argali *Ovis ammon hodgsoni* lives in the vicinity of Ganda La pass between the Rumbak and Markha Valleys. These are descendants of a small group which wandered into the area in the 1980s, the limit of the normal range of this species being in the Taglang La region, some 75 km to the east (Fox *et al.* 1986, Mallon & Bacha 1989). There is also a small population of the Asiatic Ibex *Capra sibirica* in the northwestern part of the park.

Wild Dog *Cuon alpinus* is widespread in suitable forest habitats in the plains. The race *laniger*, distributed from Altai mountains to Manchuria (Prater 1980), is found in Hemis.

Another major predator is the Tibetan Wolf *Canis lupus chanco*, widespread in the alpine and other flat areas. It is also a different race from that of the Indian plains. Eurasian Lynx *Lynx lynx* has been reported, but is presumably very rare.

Smaller predators are Red Fox *Vulpes vulpes*, Mountain Weasel *Mustela altaica*, Stone Marten *Martes foina*, and Pallas's Cat *Otocolobus manul*, which feed on birds and small mammals such as the Large-eared Pika *Ochotona macrotis*, Tibetan Woolly Hare *Lepus oiostolus*, and Himalayan Marmot *Marmota bobak*. Eurasian Otter *Lutra lutra* has also been reported (Mallon & Bacha 1989).

Amphibians are not recorded, but reptiles are represented by three species of lizard: Himalayan Agama *Laudakia himalayana* (numerous), Ladakh Skink *Scincella ladacensis* (sparsely distributed), and Toad Agama *Phrynocephalus reticulatus*, which is restricted to the stony desert in the northern part of the park (Mallon & Bacha 1989).

LAND USE

- Tourism and recreation
- Nature conservation and research
- Agriculture
- Pasture, grazing land

THREATS AND CONSERVATION ISSUES

- Road construction
- Poaching, particularly of wolf pups from their dens (a major problem)
- Tourism and related infrastructure
- Wildlife-Livestock conflict

Hemis National Park has some 1,600 residents distributed among 23 settlements, but there are no permanent settlements in the core area. In addition, people from outside use the park's resources, particularly for grazing. Most residents are engaged in both agriculture and pastoralism, while those in the upper Chang Chu are semi-nomadic, typical of the eastern plateau of Ladakh. Less than 1% of the park's total area is cultivated, the main crops being barley and peas. All families own some domestic livestock. Traditional grazing rights are respected, preventing degradation of pastures from overgrazing. Trees, wherever available, and shrubs generally are used for timber, fuel, and winter fodder. *Artemisia*, *Caragana*, and *Acantholimon* shrubs are commonly used for fuel; *Aconogonum tortuosum* and *Stachys tibetica* as winter fodder. Animal dung is also used for fuel, precluding its use as fertiliser on fields or pastures (Mallon & Bacha 1989). *Hippophae* (Sea Buckthorn) is used in the villages to protect livestock corrals from predators. Most alarming is the number of traditional livestock protection measures being adopted by the locals, the most serious being the trapping of wolf pups in their dens. This was revealed by the locals during the Workshop on "Conflict, Planning and Management" conducted by the International Snow Leopard Trust (ISLT) during October 1999. The gravest concern during the Workshop was that in May–June all the villagers undertake special drives to locate

wolf dens and kill the pups wherever located. This practice needs to be checked by the Wildlife staff. Fires and placing *Hippophae* around the corrals, trapping, noise-making, and watchdogs are the traditional anti-predator measures adopted by the locals to protect their livestock.

Immediate objectives are to develop infrastructure, eliminate current land use and disturbance in the core area, and develop strategies in consultation with the local people for resource management in the buffer zone for the benefit of residents, without detriment to the habitat. Reduction in grazing, and the establishment of fuel wood plantations are high priorities. It was suggested to extend both the core and buffer zones, and to designate the whole area as a biosphere reserve (Rauf Zargar & M.S. Bacha, *pers. comm.* 2003). This step has not been taken yet.

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HIRPORA WILDLIFE SANCTUARY

IN-JK-08

IBA Site Code : IN-JK-08

District : Shopiyan

Coordinates : 33° 30' to 33° 42' N, 74° 33' to 74° 43' E

Ownership : State Wildlife Department

Area : 341.25 sq. km

Altitude : 2,557–4,745 msl

Precipitation : 800–900 mm + snowfall

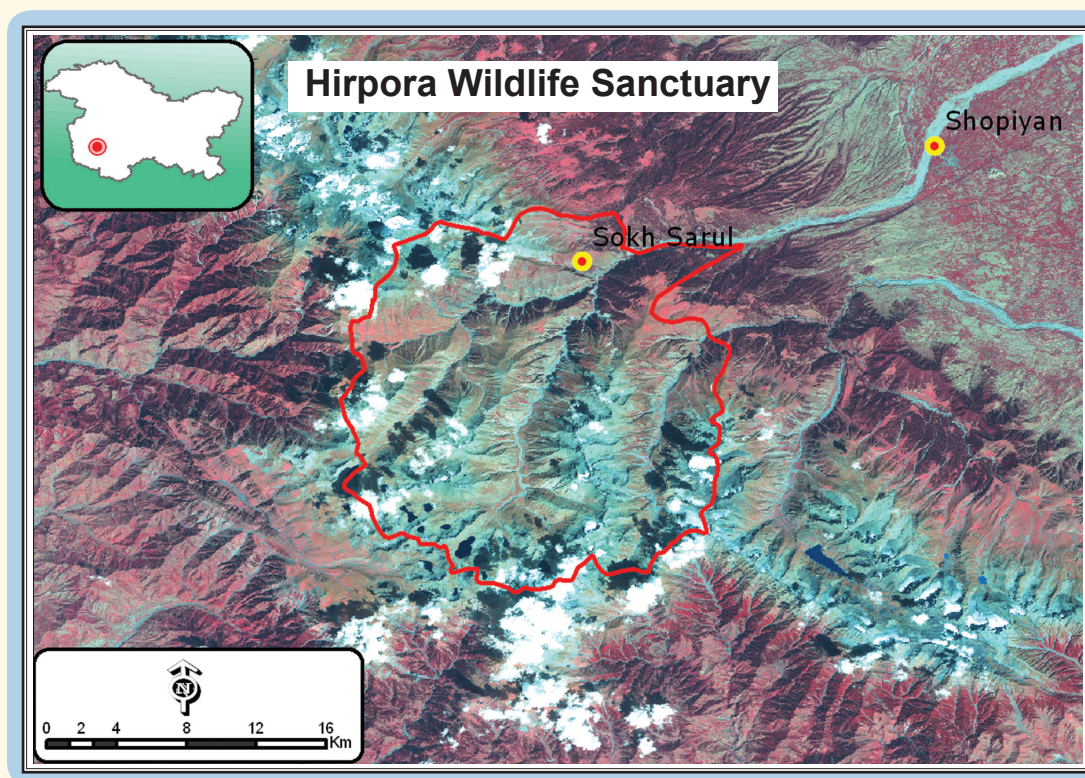
Temperature : -3 °C to 28 °C

Biogeographic : Zone Himalaya

Habitats : Himalayan Wet Temperate,
Himalayan Moist Temperate,
Himalayan Secondary Scrub

IBA CRITERIA: A1 (Threatened Species), A2 (Endemic Bird Area 128: Western Himalaya)

PROTECTION STATUS: Wildlife Sanctuary, established in 1987.



GENERAL DESCRIPTION

Hirpora, a reserve forest within Shopiyan Forest Division, was notified as a sanctuary in 1987. It lies in the Pir Panjal range, 70 km south of Srinagar. It is bounded to the north by Lake Gumsar, northeast by Hirpora village, east by Gurwatan forest, south by Bhagsar Gali, and to the west by Pir Panjal Pass (Department of Wildlife Protection, J&K 2006). The sanctuary was set up mainly to protect Markhor *Capra falconeri*, but it benefits other high altitude wildlife. The slopes are gentle to moderately steep on the eastern side of the Pir Panjal divide, and precipitous, with many cliffs, to the west and south.

Five main vegetation types can be distinguished, namely (i) Blue Pine *Pinus griffithii* forests in dry and exposed

aspects, with Silver Fir *Abies webbiana* and Spruce *Picea smithiana*, (ii) Silver Fir forests, with Blue Pine and Spruce, which forms the largest component of the vegetation and is confined to cooler, moister aspects, (iii) Evergreen (e.g., *Juniperus* spp.) or Deciduous (e.g., *Rosa* spp.) scrub in the middle and lower zones, respectively, (iv) Silver Birch *Betula utilis* forest, with an understorey of *Juniperus* spp. and *Rhododendron campanulatum*, and (v) Alpine meadows (Department of Wildlife Protection 1987).

AVIFAUNA

Earlier, the Department of Wildlife Protection (1987) had listed only 39 bird species, but according to their latest checklist (Intesar Suhail, *unpubl.* 2010) there are 109

species of birds in the sanctuary. Rashid Y. Naqash (*pers. comm.* 2003) has recorded Himalayan Monal *Lophophorus impejanus* and Koklass Pheasant *Pucrasia macrolopha*. Four species of vultures, namely the Himalayan Griffon *Gyps himalayensis*, Eurasian Griffon *Gyps fulvus*, Lammergeier *Gypaetus barbatus*, and the Endangered Egyptian Vulture *Neophron percnopterus* are found here (Intesar Suhail, *unpubl.* 2010). Among the globally Threatened species, the Vulnerable Kashmir Flycatcher *Ficedula subrubra* is definitely found here.

OTHER KEY FAUNA

Hirpora Wildlife Sanctuary, along with Limber/Lachipora (Kajinag area), has the distinction of harbouring the major part of the remaining viable population of Markhor *Capra falconeri*. These areas are ideal for population recovery of Markhor. They have the potential source population for conservation and restocking of the species in the rest of its range (Ranjitsinh *et al.* 2005). This is why the Government of Jammu & Kashmir under the guidelines of the Central Empowered Committee of the Supreme Court of India has recently launched the Markhor Recovery Project here. This has been done to mitigate the possible ill effects of the reconstruction of the historical Mughal Road which passes right through the sanctuary.

The subspecies of Markhor found in the area is *C. falconeri cashmiriensis* (Prater 1980), which has horns that diverge less, and in old males, show two complete twists or spirals. Before the enactment of the Wildlife (Protection) Act 1972, Markhor was one of the most prized game animals of the State, along with the Goral *Naemorhedus goral*. Musk Deer *Moschus chrysogaster* is also reported (R.Y. Naqash, *pers. comm.* 2003). Brown Bear *Ursus arctos* is found in the alpine and subalpine regions, while Himalayan Black Bear *U. thibetanus* is widespread at lower altitudes. Other mammalian species are Red Fox *Vulpes vulpes*, Common Otter *Lutra lutra*, Yellow-throated Marten *Martes flavigula*, and Royle's Pika *Ochotona roylei*.

LAND USE

- Grazing
- Agriculture
- Tourism due to recent reopening of Mughal Road

ENDANGERED	
Egyptian Vulture	<i>Neophron percnopterus</i>
VULNERABLE	
Kashmir Flycatcher	<i>Ficedula subrubra</i>



INTESAR SUHAIL

Hirpora IBA has excellent Himalayan Temperate forest which is the habitat of a large number of bird species



PANKAJ CHANDAN

On the higher reaches above 3,500 msl extensive Secondary Scrub and grassland are found



DHRITIMAN MUKHERJEE

Himalayan Snowcowk *Tetraogallus himalayensis* is found above the tree-line in Hirpora

THREATS AND CONSERVATION ISSUES

- Overgrazing
- Deforestation
- Disturbance due to vehicular traffic

Overgrazing by nomadic graziers is the major problem. Illicit tree felling by local smugglers has also become a big problem. Lack of data on wildlife is yet another major problem. Immediate surveys to document the biodiversity of this sanctuary should be taken up by local NGOs, universities, Forest Department officials, and concerned individuals.

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Intesar Suhail, Pankaj Chandan.

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HOKARSAR WETLAND CONSERVATION RESERVE

IN-JK-09

IBA Site Code : IN-JK-09

District : Budgam, Srinagar

Coordinates : 33° 59' 48" N, 74° 56' 08" E

Ownership : Department of Wildlife Protection

Area : 1,375 ha

Altitude : 1,580 msl

Precipitation : 550 mm + snowfall

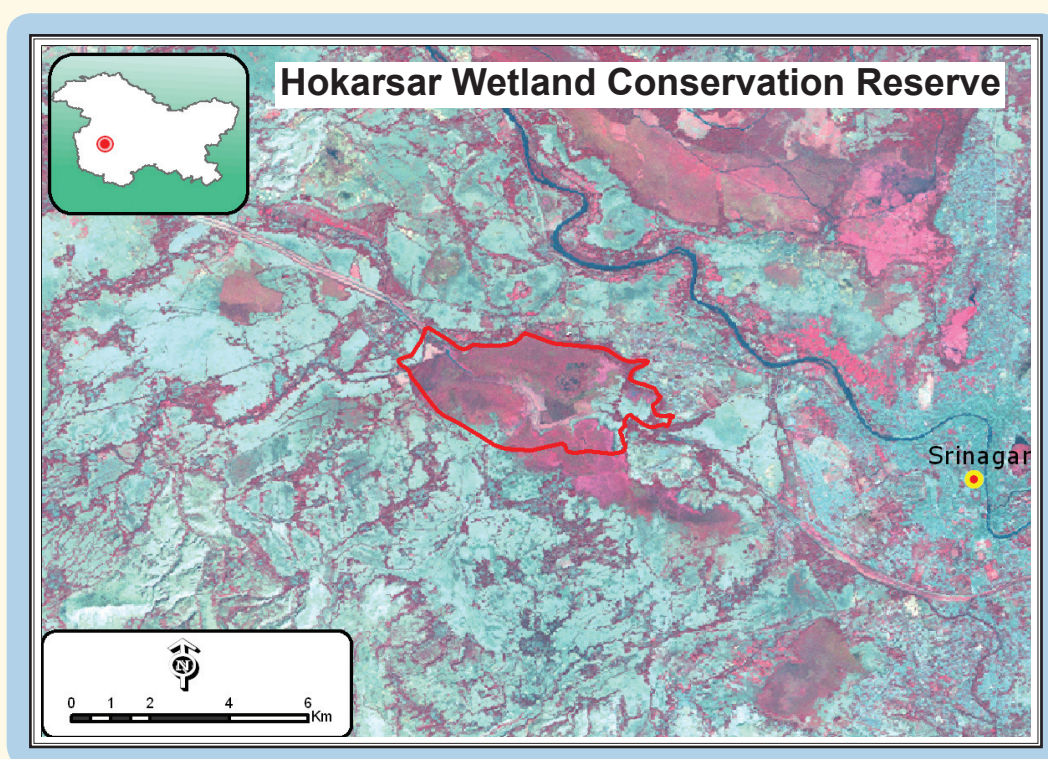
Temperature : -2 °C to 35 °C

Biogeographic Zone : Himalaya

Habitats : Seasonal Marsh

IBA CRITERIA: A1 (Threatened Species), A4iii (>20,000 Waterbirds)

PROTECTION STATUS: Wetland Conservation Reserve.



GENERAL DESCRIPTION

Hokarsar, a renowned waterfowl reserve, lies c. 10 km west of Srinagar on the Srinagar-Baramulla highway, on the banks of the River Jhelum. It is fed by the perennial Doodhganga river, which makes its way through village Hajibagh to meet the Jhelum. Sukhang stream enters the area near village Narabal on the northwest and ultimately drains directly into the Doodhganga near Sozeith village. The water table depends upon the discharge from the Doodhganga spill channel. In recent years, the water from this channel has been diverted for cultivation, resulting in reduced supply to Hokarsar Lake. Moreover, due to deforestation in the catchment area, silt is brought down by the river, threatening the very existence of this important waterfowl habitat. The lake reaches a maximum depth of 2.5 m in spring during snowmelt and a minimum of 0.7 m in autumn.

The vegetation ranges from submerged, attached, and free floating to emergent. Shallow areas support thick stands of *Typha* and *Phragmites*. *Trapa natans*, *Nymphoides peltatum*, *N. candida*, and *N. stellata* occur in the open water areas. At least 156 species of phytoplankton have been recorded, with algae Chlorophyceae dominating. There are many floating gardens in the lake. Plantation of *Salix alba* has been taken up along the shoreline, while rice is grown in the surrounding areas. These crop fields also provide foraging areas for birds.

Hokarsar Conservation Reserve is a Ramsar Site, fulfilling Criteria 2, 5, and 6 (Islam & Rahmani 2008).

AVIFAUNA

Hokarsar is important for both resident and migratory waterfowl. Hussain (1989) counted 64 species in and around the wetlands during bird ringing studies. The lake

is particularly important as a wintering area for migratory ducks and geese, and as a breeding area for herons, egrets, and rails. The common species are Greylag Goose *Anser anser* (10,000), Ruddy Shelduck *Tadorna ferruginea* (100), Common Teal *Anas crecca* (10,000), Northern Pintail *A. acuta* (15,000), Eurasian Wigeon *A. penelope* (7,000), Mallard *A. platyrhynchos* (15,000), Garganey *A. querquedula* (3,000), Gadwall *A. strepera* (5,000), Northern Shoveller *A. clypeata* (5,000), Common Pochard *Aythya ferina* (10,000), White-eyed or Ferruginous Pochard *A. nyroca* (1,000), and Red-crested Pochard *Rhodonessa rufina* (2,000). Many of these species are found in much greater numbers than the 1% of biogeographic population threshold determined by Wetlands International (2006). More recent records are also available. During the BNHS-MoEF Avian Influenza Surveillance and Monitoring Study (2005–2007), Khursheed Ahmad recorded a huge concentration of wintering ducks, including Northern Pintail (1,000), Cotton Teal (1,892), Eurasian Wigeon (2,270), Mallard (21,622), Gadwall (21,000), Northern Shoveller (54,000), Common Teal (8,000), Red-crested Pochard (200), Common Pochard (5,405), and White-eyed or Ferruginous Pochard (50) in Hokarsar Wetland Reserve. These waterfowl concentrations were highest during February (Rahmani *et al.* 2008) when the numbers could go up to 500,000. Khursheed Ahmad also reported sighting Western Marsh

VULNERABLE

Pallas's Fish-eagle *Haliaeetus leucoryphus*

NEAR THREATENED

Ferruginous Pochard *Aythya nyroca*

Harrier *Circus aeruginosus* (14), Caspian Tern *Sterna caspia* (135), Black-bellied Tern *Sterna acuticauda* (10), and the Vulnerable Pallas's Fish-eagle *Haliaeetus leucoryphus* (01) during 2005–2007 (Rahmani *et al.* 2008).

Breeding species include the Little Grebe *Tachybaptus ruficollis*, Little Bittern *Ixobrychus minutus*, Grey Heron *Ardea cinerea*, Black-crowned Night Heron *Nycticorax nycticorax*, Little Egret *Egretta garzetta*, Water Rail *Rallus aquaticus*, Common Moorhen *Gallinula chloropus*, and Pheasant-tailed Jacana *Hydrophasianus chirurgus*. A small number of Common Crane *Grus grus* is also seen in some years. Among the globally Threatened species, Pallas's Fish-eagle *Haliaeetus leucoryphus* is resident (Scott 1989) but there is no recent breeding record.

The Department of Wildlife Protection, Jammu & Kashmir Government, conducts annual waterfowl surveys (Bacha 2002). According to this survey report, on January 12, 2002, more than 370,000 birds were counted. There has been considerable increase in waterfowl numbers since shooting was stopped. The most recent Waterfowl Census



In winter upto 500,000 waterbirds, mainly Mallard, Northern Pintail, Common Teal and Garganey, are seen in Hokarsar

conducted in February 2012 yielded a total bird count of around 600,000–700,000 wintering birds in Hokarsar Wetland Reserve (Rauf Zargar, *pers. comm.* 2012). [six-seven lakh birds. During an IBCN members' meet organized in Hokarsar on February 2012 under Dr. Asad R. Rahmani, a considerable population of around 300,000 wintering birds were sighted.

OTHER KEY FAUNA

The Common Otter *Lutra lutra* is common in the lake. Other mammals known to occur in this reserve include the Red Fox *Vulpes vulpes* and Golden Jackal *Canis aureus*. The lake supports rich fish fauna including *Cyprinus carpio*, *Crossocheilus* sp., *Barbus conchoni*, and *Gambusia affinis*.

LAND USE

- Fishing
- Harvesting of reeds in summer
- Paddy cultivation in the surrounding areas
- Tourism

THREATS AND CONSERVATION ISSUES

- Siltation
- Encroachment
- Disturbance to birds
- Agricultural intensification
- Poaching
- Pesticide pollution from adjoining agricultural fields

Silt deposition from the Doodhganga catchment area has reduced the depth and surface area of the water, especially during summer months, thus the edges are exposed to encroachment for paddy cultivation or willow plantation by the locals. It appears that the lake has shrunk to one third of its former size. Various proposals have been made for the management of the lake, including weeding, dredging, raising of bunds, diversion of the

Doodhganga spill channel to reduce siltation, and erection of a perimeter fence.

Fishing and harvesting of reeds also disturbs the birds. Reed harvesting is particularly destructive to breeding birds, but some control of reeds is also required. In recent years, cultivation of mushrooms has started along the northern boundary.

The main threats are increased siltation, eutrophication, and encroachment of agriculture on the marshes peripheral to the lake. Fertilizer run-off from the nearby fields into the lake accelerates eutrophication.

Encroachment is a major threat to the site. Poaching by influential people still occurs, especially with the connivance of police and high government officials. For example, in March 1998, 20 such poachers went on a killing spree for almost 15 days. The forest guards who resisted were shunted out. However, due to media vigilance and pressure on the Department of Wildlife Protection following the incident, it is hoped that this will not happen again.

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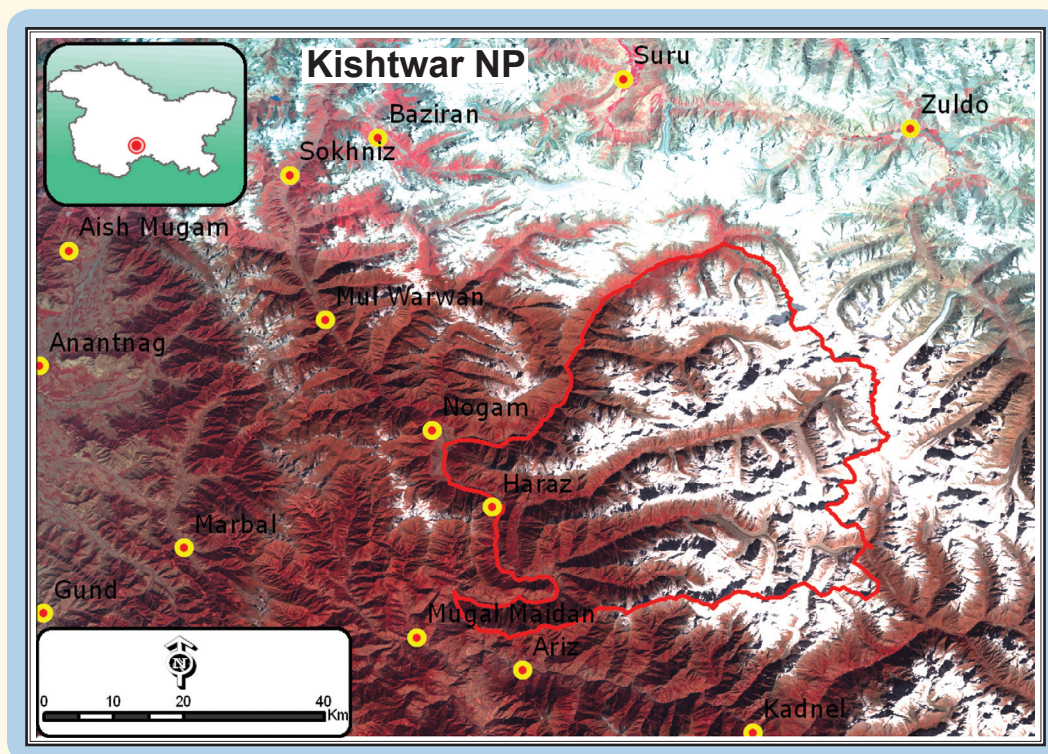
KISHTWAR NATIONAL PARK

IN-JK-10

IBA Site Code	: IN-JK-10	Temperature	: -7 °C to 35 °C
District	: Doda	Biogeographic Zone	: Himalaya
Coordinates	: 33° 37' 12" N, 76° 12' 30" E	Habitats	: Himalayan Temperate,
Ownership	: State		Himalayan Moist Temperate
Area	: 40,500 ha		Forests, Himalayan Secondary
Altitude	: 1,700–4,800 msl		Forest, Alpine Moist Scrub,
Precipitation	: 827 mm + snowfall		Alpine Dry Pasture

IBA CRITERIA: A1 (Threatened Species), A2 (Endemic Bird Area 128: Western Himalaya), A3 (Biome 5: Eurasian High Montane – Alpine and Tibetan, Biome 7: Sino-Himalayan Temperate Forest)

PROTECTION STATUS: National Park, established in 1981.



GENERAL DESCRIPTION

This high altitude national park is named after the old town of Kishtwar in Doda district. It is located c. 40 km northeast of Kishtwar. Like most of the protected areas in Kashmir, Kishtwar NP is the catchment area of many rivers and streams (nullahs). The important ones are Kiyar, Nanth, and Kibber Nullahs, all draining southwest into Marau river which joins the River Chenab just above Kishtwar town. The Marau drains the western slopes of the Bramah and Nun Kun ranges. The park is bounded to the north by the River Rinnay, to the south by Kibber Nullah catchment, to the east by the main divide of the Great Himalaya, and to the west by Marau river.

The terrain is mostly precipitous and rugged. Moderate to very steep slopes are seen, mostly covered with thick forests. The slopes are broken by rocky cliffs, which form ideal habitats for the Himalayan Ibex *Capra sibirica*.

Due to its latitude, high altitude, high ridges and narrow, deep, forest-covered valleys, the climate is extreme. Winters are most severe, and in some areas winter rains are common, although most precipitation is in the form of snow. Strong winds enhance the extreme cold in winter.

Kishtwar NP has 13 main vegetation types, from Alpine Grasslands, to Mixed Coniferous forests, to Oak-Fir forests. Broadleaf forest occurs in the nullahs and cool, damp aspects. Silver Fir *Abies pindrow* occurs in pure stands,

VULNERABLE

Western Tragopan	<i>Tragopan melanocephalus</i>
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ENDEMIC BIRD AREA 128: WESTERN HIMALAYA

Western Tragopan	<i>Tragopan melanocephalus</i>
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BIOME 5: EURASIAN HIGH MONTANE

Himalayan Griffon	<i>Gyps himalayensis</i>
Snow Partridge	<i>Lerwa lerwa</i>
Himalayan Snowcock	<i>Tetraogallus himalayensis</i>
Snow Pigeon	<i>Columba leuconota</i>
Alpine Accentor	<i>Prunella collaris</i>
Red-mantled Rosefinch	<i>Carpodacus rhodochlamys</i>

BIOME 7: SINO-HIMALAYAN TEMPERATE FOREST

Koklass Pheasant	<i>Pucrasia macrolopha</i>
Himalayan Monal	<i>Lophophorus impejanus</i>
Himalayan Pied Woodpecker	<i>Dendrocopos himalayensis</i>
Variegated Laughingthrush	<i>Garrulax variegatus</i>
Slaty-blue Flycatcher	<i>Ficedula tricolor</i>
Fire-capped Tit	<i>Cephalopyrus flammiceps</i>
Green-backed Tit	<i>Parus monticolus</i>
White-cheeked Nuthatch	<i>Sitta leucopsis</i>
Pink-browed Rosefinch	<i>Carpodacus rhodochrous</i>
White-browed Rosefinch	<i>Carpodacus thura</i>
Brown Bullfinch	<i>Pyrrhula nipalensis</i>
Red-headed Bullfinch	<i>Pyrrhula erythrocephala</i>
Spotted-winged Grosbeak	<i>Mycerobas melanozanthos</i>
Yellow-billed Blue Magpie	<i>Urocissa flavirostris</i>

but also mixed with Cedar or Deodar *Cedrus deodara* and Kail *Pinus wallichiana*. In general, Silver Fir and Spruce *Picea wallichiana*, mixed with Cedar and Blue Pine *Pinus griffithii*, are predominant from 2,400 to 3,000 msl. The main forest types are Moist Deodar Forest, Western Mixed Coniferous Forests, Moist Temperate Deciduous Forest, Low-level Blue Pine Forest, West Himalayan Upper Oak Forest, Chilgoza Pine Forest, Dry Deodar Forests, Parrotia Scrub Forests, West Himalayan High Level Dry Blue Pine Forest, West Himalayan Subalpine Birch/Fir Forest, Subalpine Pasture, Birch-Rhododendron Scrub Forest, and Alpine Pasture (Anon. undated).

AVIFAUNA

No detailed study has been conducted on the avifauna of Kishtwar NP. Scott *et al.* (1988) during their 'Kashmir Expedition' recorded 78 species of birds, including the Himalayan Monal *Lophophorus impejanus* and Koklass Pheasant *Pucrasia macrolopha*. The globally Threatened Western Tragopan *Tragopan melanocephalus* has also been reported. Recently, an injured bird was found by the forest officials, and later released.

M.M. Baba (*pers. comm.* 2003) prepared a checklist of 115 species, which includes many species found in Biome 5



Himalayan Monal *Lophophorus impejanus* is a Biome 7 species

(Eurasian High Montane – Alpine and Tibetan) and Biome 7 (Sino-Himalayan Temperate Forest).

OTHER KEY FAUNA

Kishtwar is famous for its high altitude fauna, from the elusive Snow Leopard *Panthera uncia* to the commoner Himalayan Ibex *Capra sibirica himalayensis*. During a census in 1999 by the staff of the Forest Department, 612 Ibex were found in Kibber, Nath, and Kiyar areas. Brown Bear *Ursus arctos* occurs mainly in subalpine and alpine regions, while the Himalayan Black Bear *U. thibetanus* is found in the lower reaches, where the Leopard *Panthera pardus* is also found. Himalayan Musk Deer *Moschus chrysogaster*, Indian Muntjak *Muntiacus muntjak*, Serow *Naemorhedus sumatraensis*, Goral *Naemorhedus goral*, and Wild Boar *Sus scrofa* are some of the ungulates. The Hangul *Cervus elaphus hanglu* is also reported, especially during winter. Bharal or Blue Sheep *Pseudois nayaur* is found in the alpine regions, where it is the main prey of the Snow Leopard. There are reports of Markhor *Capra falconeri*. The Common Langur was split into seven species (Groves 2001). Of these, the Himalayan Grey Langur *Semnopithecus ajax* is found in Kishtwar.

The most important areas for wildlife are considered to be the Kiyar and Kibber Valleys. Hangul is reported from

Kiar, but only in the severest of winters when animals are thought to migrate from Dachigam, 100–150 km to the northwest. Goral is reported to occur around Sondar and Sirshi, Ibex in the Bramah area, and Snow Leopard in Upper Kiyar (Scott *et al.* 1988).

LAND USE

- Nature conservation and research

THREATS AND CONSERVATION ISSUES

- Encroachment
- Poaching
- Grazing
- Hydel power station
- Wildlife-livestock conflict

Before 1948, commercial logging was rampant, with almost no control by the Forest Department. After the merger of the state with the Indian Union, the Forest Department took control and unrestricted tree felling came to a halt: only planned scientific logging was done. This also ceased with the establishment of the national park (Bacha 1986).

The disturbance from graziers and their livestock is high, and the need to control it is recognized. Encroachment and poaching are persistent problems. Himalayan Black Bear and Rhesus Macaque *Macaca mulatta* cause damage to crops, while Leopard and Brown Bear kill livestock (Kurt 1976, Bacha 1986, Scott *et al.* 1988), creating resentment against the park. The problem of human-animal conflict has to be addressed to gain the support of local people.

There are plans for a hydel power dam at Hunzal, on the Marau river, which would not only inundate large areas of forest but also pose a considerable threat to wildlife from the inevitable road construction and import of thousands of labourers (Gaston 1982; B.A. Shah, Wildlife Warden Kishtwar, *pers. comm.* 2012).

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M.S. Bacha, Rahul Kaul, M.M. Baba, Peter Garson, Pankaj Chandan.



GAURAV SHARMA

Chestnut-eared Bunting is seen in Kishtwar National Park

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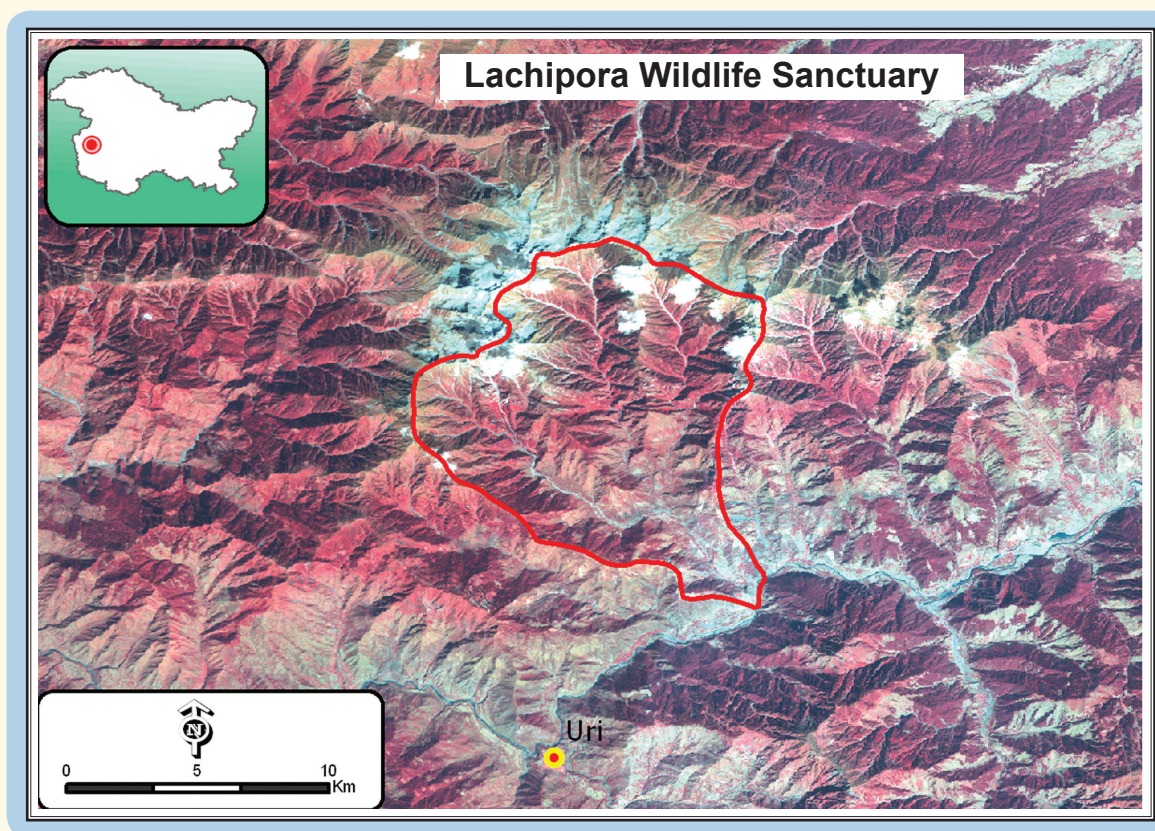
LACHIPORA WILDLIFE SANCTUARY

IN-JK-11

IBA Site Code	: IN-JK-11	Altitude	: 1,630–3,300 msl
District	: Baramulla	Precipitation	: 650–750 mm + snowfall
Coordinates	: 34° 13' 31" N, 74° 21' 48" E	Temperature	: -3 °C to 24 °C
Ownership	: State Wildlife Department	Biogeographic Zone	: Himalaya
Area	: 9,350 ha	Habitats	: Subtropical Pine Forest, Alpine Moist Pasture

IBA CRITERIA : A1 (Threatened Species), A2 (Endemic Bird Area 128: Western Himalaya)

PROTECTION STATUS : Wildlife Sanctuary, established in March 1987.



GENERAL DESCRIPTION

Lachipora Wildlife Sanctuary is named after village Lachipora, which lies within the fringes of the protected area (Bacha 2000). The sanctuary is c. 90 km west of Srinagar, and occupies the north bank of the River Jhelum. It is bounded to the north by Kakau Forest in Langet Forest Division, to the south by Maidan Forest, to the southeast by the River Jhelum, to the west by the Ceasefire Line and to the east by Bagna and Limber Forests (Department of Wildlife Protection 1987).

The terrain is montane, with gentle to steep slopes, sometimes broken by huge rocky cliffs. In the upper reaches, the folds are thrown into a number of inaccessible

undulations, enclosing narrow gullies, locally called *nar* (Bacha 2000).

Lachipora WLS was established primarily to protect the Markhor *Capra falconeri* (Department of Wildlife Protection 1987). As the elevation varies from 1,600 to 3,300 msl, the vegetation also varies from Broadleaf through Coniferous Forest to Alpine Grassland/Meadows. The Broadleaf forest consists of Horse Chestnut *Aesculus indica* and Silver Birch *Betula utilis*, woodlands of *Aesculus indica*, *Juglans regia*, *Acer cappadocium* association, *Betula utilis*, and *Abies pindrow*. The Coniferous forests have pure Deodar *Cedrus deodara* stands, dotted with isolated Blue Pine *Pinus wallichiana*. Blue Pine forests are just the reverse

IN-JK-11



INTESAR SUHAIL

Himalayan Griffon *Gyps himalayensis* is the major avian scavenger of Lachipora WLS

with *P. wallichiana* dominating and scattered *C. deodara*. Silver Fir woodland, found on steep dry slopes up to 3,500 msl, consists of *Abies pindrow*, *Picea smithiana*, and *Pinus wallichiana*, with scattered *Betula utilis* in the higher reaches. The alpine meadow pastures, above the tree line, are locally called *margs*. The dominant vegetation is herbaceous, with stunted bushes and isolated trees in folds. *Primula*, *Potentilla*, *Caltha*, *Inula*, *Gentiana*, *Anemone*, and *Corydalis* are some of the common genera. Woody clumps consist of rhododendrons and junipers.

AVIFAUNA

The Department of Wildlife Protection (1987) has prepared a bird checklist. Most noteworthy is the Western Tragopan *Tragopan melanocephalus*. Himalayan Monal *Lophophorus impejanus* and Koklass Pheasant *Pucrasia macrolopha* are also reported, along with the Chukor Partridge *Alectoris chukar*.

No work has been done on the avifauna of this area, but as Lachipora is adjacent to Limber Valley and Gulmarg (both IBAs), the birdlife is very similar. This area was selected as an IBA due to the presence of a healthy population of the globally Threatened Western Tragopan.

VULNERABLE	
Western Tragopan	<i>Tragopan melanocephalus</i>
ENDEMIC BIRD AREA 128: WESTERN HIMALAYA	
Western Tragopan	<i>Tragopan melanocephalus</i>

OTHER KEY FAUNA

Lachipora is one of the last refuges in India of the Markhor *Capra falconeri*. It also has a good population of Goral *Naemorhedus goral*. Himalayan Musk Deer *Moschus chrysogaster* is found in the higher reaches. Lachipora is reported to face poaching pressure owing to which the Musk Deer here remains quite elusive and uncommon. Among the bear species, both Brown Bear *Ursus arctos* and Himalayan Black Bear *U. thibetanus* are found, with the former confined to alpine regions. Leopard *Panthera pardus* is widely distributed, especially around villages, where it comes into conflict with humans and does considerable damage to livestock and human life. Not much information is available on smaller mammals, reptiles, and other fauna.

LAND USE

- Human settlements

- Agriculture
- Grazing

THREATS AND CONSERVATION ISSUES

- Grazing
- Firewood collection
- Poaching

There are 11 villages within the catchment area of Katha Nilnag, of which Lachipora is the largest. The villagers own fields and orchards, and they have rights of grazing and collecting timber and medicinal plants in the sanctuary. Unsustainable exploitation of natural resources from the sanctuary by the local people is the biggest threat. The severity of floods in 1995 proved that the forest is under severe biotic pressure. Alternative arrangements for fuel wood and fodder must be made if exploitation is to be minimized. As the sanctuary is close to the Ceasefire Line between India and Pakistan, presence of army and paramilitary forces puts additional pressure on wildlife. The State Department of Wildlife Protection has come up with a management plan for the sanctuary to tackle some of these issues (Bacha 2000). Lachipora Wildlife Sanctuary along with Limber WLS is included in the Species Recovery Programme for Markhor formulated by this department in 2006 (Intesar Suhail, *unpubl.* 2006). The programme envisages improvement of the area for the recovery and propagation of Markhor and other species through various conservation measures.

KEY CONTRIBUTORS

M.S. Bacha, Intesar Suhail.



Tawny Owl *Strix aluco* is sometimes seen in Lachipora

KHURSHED AHMAD

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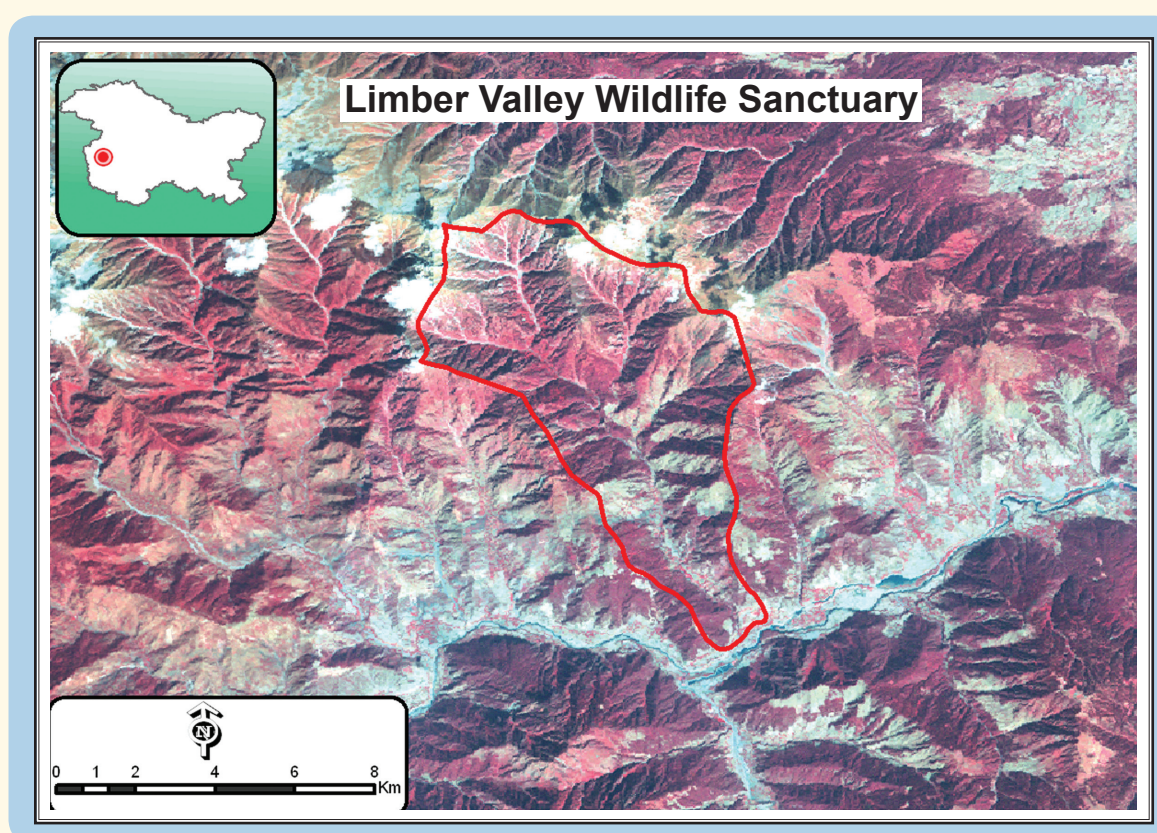
LIMBER VALLEY WILDLIFE SANCTUARY

IN-JK-12

IBA Site Code	: IN-JK-12	Precipitation	: 650–750 mm + snowfall
District	: Baramulla	Temperature	: -3 °C to 24 °C
Coordinates	: 34° 8' 32" N, 74° 22' 18" E	Biogeographic Zone	: Himalaya
Ownership	: State Wildlife Department	Habitats	: Subtropical Pine Forest, Himalayan Wet Temperate, Alpine Moist Pasture
Area	: 4,375 ha		
Altitude	: 2,300–4,000 msl		

IBA CRITERIA : A1 (Threatened Species), A2 (Endemic Bird Area 128: Western Himalaya), A3 (Biome 5: Eurasian High Montane, Biome 7: Sino-Himalayan Temperate Forest)

PROTECTION STATUS : Wildlife Sanctuary, established in 1987.



GENERAL DESCRIPTION

Limber Valley Wildlife Sanctuary derives its name from the Limber Nullah that drains it and Limber village that lies in its lower catchment. It is c. 74 km northwest of Srinagar, on the Srinagar-Uri national highway. It is bounded to the north by Bhurji Forest in Langet Forest Division, to the south by River Jhelum, to the east by Katha Forest and to the west by Salamabad Forest.

Earlier it was a game reserve, but in 1987 it was notified as a wildlife sanctuary with a core area of 1,200 ha. It comprises the entire catchment of Limber Nullah, which flows almost north to south, and joins the Jhelum near Pringal village. The terrain consists of steep slopes, broken

by precipitous cliffs in the upper reaches of the valley. Extensive avalanches and landslides are characteristic of the upper reaches. Limber WLS contains several floral types. The coniferous forest consists of Deodar *Cedrus deodara* dominated forest, with Parrotia *Parrotiopsis jacquemontiana* and Viburnum *Viburnum grandiflorum* understorey; Blue Pine forest dominated by *Pinus wallichiana*, with stands of Deodar, Silver Fir *Abies pindrow*, and Spruce *Picea smithiana*; and Silver Fir forest, with some Pine and Spruce. Broadleaf forest consists of Chenar *Platanus orientalis* stands near Limber village, Walnut *Juglans regia* wood cover, and stands of Horse Chestnut *Aesculus indica* near the riverine belt of Viji (Mithawani area). The tree line

along the gentle alpine slopes supports Silver Birch *Betula utilis*, with isolated trees of Horse Chestnut, Silver Fir, and Walnut. Juniper *Juniperus recurva* and Rhododendron *Rhododendron anthopogon* grow at higher elevations.

The alpine meadows have a rich herbaceous ground cover of species of *Inula*, *Caltha*, *Primula*, *Potentilla*, *Corydalis*, *Gentiana*, *Anemone*, *Myosotis*, and *Polygonum* (Bacha 1999).

VULNERABLE

Western Tragopan	<i>Tragopan melanocephalus</i>
Cheer Pheasant	<i>Catreus wallichii</i>

ENDEMIC BIRD AREA 128: WESTERN HIMALAYA

Western Tragopan	<i>Tragopan melanocephalus</i>
Cheer Pheasant	<i>Catreus wallichii</i>

BIOME 5: EURASIAN HIGH MONTANE

Himalayan Griffon	<i>Gyps himalayensis</i>
Himalayan Snowcock	<i>Tetraogallus himalayensis</i>

BIOME 7: SINO-HIMALAYAN TEMPERATE FOREST

Himalayan Monal	<i>Lophophorus impejanus</i>
Streaked Laughingthrush	<i>Garrulax lineatus</i>
Variegated Laughingthrush	<i>Garrulax variegatus</i>
Fire-capped Tit	<i>Cephalopyrus flammiceps</i>
Simla Crested Tit	<i>arus rufonuchalis</i>
Spot-winged Crested Tit	<i>Parus melanolophus</i>
Green-backed Tit	<i>Parus monticolus</i>
Yellow-billed Blue Magpie	<i>Urocissa flavirostris</i>

AVIFAUNA

Limber Valley is one of the most important sites for the globally Endangered and restricted-range Western Tragopan *Tragopan melanocephalus* and Cheer Pheasant *Catreus wallichii*. According to the Department of Wildlife Protection (Bacha 2000), the average density of Western Tragopan in potential areas is 5 birds/sq. km, with an approximate population of 156 to 170 birds. In more suitable areas, the density is 6 birds/sq. km, perhaps the highest in the world. This site was selected as an IBA because of the presence of these two threatened species.

Koklass Pheasant *Pucrasia macrolopha*, Himalayan Monal *Lophophorus impejanus*, Himalayan Snowcock *Tetraogallus himalayensis*, and Chukor Partridge *Alectoris chukar* are also present. Among raptors, Golden Eagle *Aquila chrysaetos*, Oriental Hobby *Falco severus*, and Lammergeier *Gypaetus barbatus* are frequently seen (Javed 1992). Many restricted-range and biome-restricted species are also seen here. Javed (1992) identified 74 species during two surveys in 1988 and 1989. Hussain (1989) during bird ringing studies ringed 70 species.

Limber Valley lies in the Western Himalaya Endemic Bird Area (EBA 128), where Stattersfield *et al.* (1998) have listed 11 restricted-range species. Of these, two have been found in Limber, both with significant populations.



GAURAV SHARMA

IBAs are important for many 'common' species such as Yellow-breasted Greenfinch *Carduelis spinodias*, also called Himalayan Greenfinch

The Limber Valley has two biomes: Biome 5 Eurasian High Montane (Alpine and Tibetan) above c. 3,600 msl, and Biome 7 Sino-Himalayan Temperate Forest, between 1,800 and 3,600 msl. BirdLife International (undated) has prepared a list of biome species. Out of the 48 Biome 5 species, two are found here, both widespread and common. Similarly, eight species of Biome 7 are found, out of 112 listed by BirdLife International. Detailed research on the birds of Limber Valley has not been conducted, and many more species of these biomes are likely to be present.

OTHER KEY FAUNA

The area is one of the few remaining refuges of the Markhor *Capra falconeri* in Jammu & Kashmir. Limber WLS, along with Hirpora Wildlife Sanctuary in south Kashmir, has the distinction of harbouring the major part of the remaining viable population of Markhor. These areas have potential source populations for conservation and restocking of the species in the rest of its range (Ranjitsinh *et al.* 2005). The subspecies *cashmiriensis* here has horns which diverge less, and in an old male, show two complete twists or spirals (Prater 1980). Limber Valley is also famous for its population of Himalayan Black Bear *Ursus thibetanus* and Brown Bear *U. arctos*. Himalayan Black Bear is found in steep forested hills, which abound in Limber Valley. Like all animals of the temperate hilly regions, it undertakes seasonal altitudinal movement. In winter it can be seen as low as 1,525 msl. Brown Bear is found in the alpine pastures of Limber Valley, above 4,000 msl, and never comes down. It hibernates in winter. Other carnivores found in the area include the Leopard *Panthera pardus*, Leopard Cat *Prionailurus bengalensis*, and Jungle Cat *Felis chaus*.

Among ungulates, Himalayan Musk Deer *Moschus chrysogaster* is found, but it is very elusive. This is perhaps because it is still being poached in these areas. Another quite common ungulate is the Goral *Naemorhedus goral*. Leopard *Panthera pardus* is its main natural predator. Royle's Pika *Ochotona roylei* is extremely common and forms the main food of the Red Fox *Vulpes vulpes*. Kashmir Flying Squirrel *Hylopetes fimbriatus* is another small mammal found here. Himalayan Yellow-throated Marten *Martes flavigula* is one of the smaller predators. Among the primates, Rhesus Macaque *Macaca mulatta*, and Common Langur were recorded. The seven subspecies of Common Langur *Semnopithecus entellus* were raised to full species status (Groves 2001), and the species found in Limber Valley is Himalayan Grey Langur *Semnopithecus ajax*.

LAND USE

- Human settlement
- Nature conservation and research
- Tourism and recreation

THREATS AND CONSERVATION ISSUES

- Grazing
- Unsustainable exploitation of natural resources by the local population
- Poaching

Limber Valley WLS was established primarily to protect the Markhor. In 2006, the Department of Wildlife Protection, Jammu & Kashmir prepared a comprehensive Species Recovery Programme for Markhor (Suhail 2006, *unpubl.*) which was approved by the Ministry of Environment and Forests in 2007, and is being implemented here since 2009. The main objectives of the programme are to improve the habitat for Markhor recovery and propagation through afforestation, soil conservation, and curtailment of anthropogenic pressures; to create a database of the natural resources and biodiversity for monitoring the conditions of the ecosystem; to create mass awareness regarding wildlife conservation and ensure people's participation in conservation efforts through ecodevelopment activities in the adjacent villages; to create facilities for ecological research and to develop the area as an ecotourism destination. Presently, even a detailed checklist of birds is not available. It is hoped that the ecological research component of the programme will facilitate avifaunal studies, and the two rare pheasant species, which have significant populations here, and their ecology will be studied and monitored on a long-term basis.



ANANT ZANJALE

 Grey-winged Blackbird *Turdus boullboul*

KEY CONTRIBUTORS

M.S. Bacha, M.A. Parsa, Intesar Suhail.

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MIRGUND JHEEL AND RESERVE

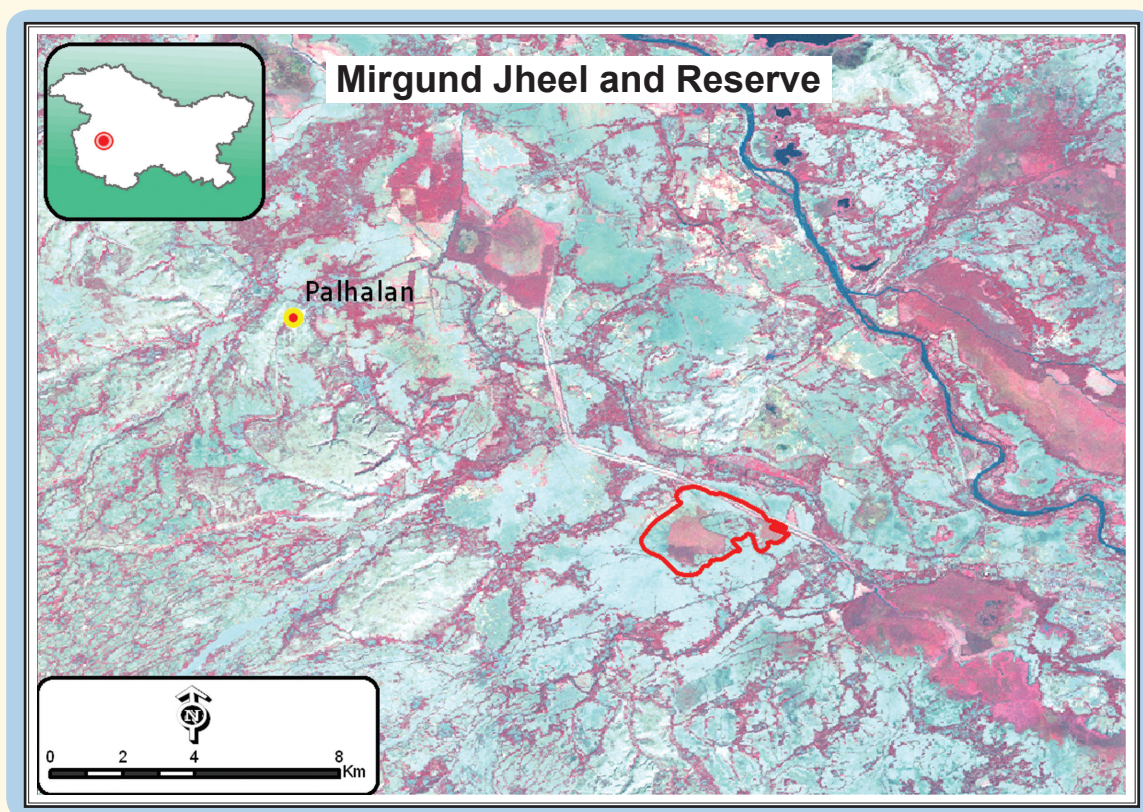
IN-JK-13

IBA Site Code	: IN-JK-13
District	: Budgam
Coordinates	: 33° 46' 57" N, 74° 45' 51" E
Ownership	: State
Area	: 300 ha
Altitude	: 1,580 msl

Precipitation	: 550 mm + snowfall
Temperature	: -2 °C to 35 °C
Biogeographic Zone	: Himalaya
Habitats	: Flooded Valley Grassland, Freshwater Swamp, Himalayan Secondary Scrub

IBA CRITERIA : A1 (Threatened Species), A4i (>1% biogeographic population)

PROTECTION STATUS : Wetland Conservation Reserve.



GENERAL DESCRIPTION

Mirgund Jheel is a shallow freshwater lake with associated reedbeds and riverine marshes on the River Jhelum. The lake is fed by snowmelt runoff and two nullahs. Much of the wetland dries out during summer, and the water level fluctuates considerably according to the melting of snow in summer, the depth varying between 0.1 and 0.5 m. Large stands of Willow *Salix alba* have been planted on the periphery of the lake (Scott 1989). Earthen bunds have been constructed to maintain the water level, and also to control siltation.

The area has extensive reedbeds and marshland. The open waterspread has floating communities of *Nymphaea candidia* and *N. stellata*. The wetland is surrounded by

paddyfields, pastures, and plantations. All these habitat types provide foraging grounds for birds.

Mirgund Wetland was proposed as a Ramsar Site by Islam & Rahmani (2008) as it qualifies for Ramsar Criteria 2, 5, and 6.

AVIFAUNA

This IBA is an important wintering and staging ground for thousands of migratory waterfowl. These include Common Teal *Anas crecca*, Northern Pintail *A. acuta*, Eurasian Wigeon *A. penelope*, Mallard *A. platyrhynchos*, Gadwall *A. strepera*, Northern Shoveller *A. clypeata*, and Common Pochard *Aythya ferina*. Little Grebe *Tachybaptus ruficollis*, Little Bittern *Ixobrychus minutus*, Little

INTESAR SUHAIL



Mirgund Jheel attracts around 20,000 waterfowl during winter. This IBA qualifies for Ramsar criteria 2,3 and 6

KHURSHED AHMAD



Mirgund has extensive marshes and weeds that are breeding grounds for species such as Water Rail, Little Bittern, and Common Moorhen

Egret *Egretta garzetta*, Water Rail *Rallus aquaticus*, Common Moorhen *Gallinula chloropus*, Pheasant-tailed Jacana *Hydrophasianus chirurgus*, and Whiskered Tern *Chlidonias hybridus* are said to breed in the marshes. Many birds occur in much larger numbers than their 1% population threshold determined by Wetlands International (2006). During several regular visits to Mirgund Wetland between 2005 and 2007, a considerable population of waterfowl was recorded, comprising largely Common Teal and Mallard (Khursheed Ahmad, *unpubl.* 2007). In the latest Waterfowl Census carried out in February 2012, around 10,000–20,000 waterfowl, largely Common Teal, were recorded in Mirgund Wetland (Rauf Zargar, *pers. comm.* 2012)

OTHER KEY FAUNA

Not much is known about other fauna, except that the ubiquitous Golden Jackal *Canis aureus* occurs here. A variety of fishes such as *Cyprinus carpio*, *Barbus conchoniuss*, and *Gambusia affinis* are found in the jheel.

LAND USE

- Agriculture
- Nature conservation

THREATS AND CONSERVATION ISSUES

- Siltation
- Agricultural intensification and expansion
- Encroachment
- Livestock grazing

The Department of Wildlife Protection, Jammu & Kashmir, protects the lake as a reserve for waterfowl. Parts of the marsh have been fenced to prevent damage by cattle. Earthen bunds have been constructed to maintain water levels. Proposals have been made to fence the entire area and plant Water Chestnut *Trapa natans*. Earlier, regulated hunting of waterfowl was allowed, but now it has been stopped. However, the birds are not being monitored. If effective conservation measures are taken, this IBA could become one of the most important waterfowl refuges of northern India.

KEY CONTRIBUTORS

M.A. Parsa, M.R. Dar, Khursheed Ahmad.

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- Wetlands International (2006) *Waterbird Population Estimates: Fourth Edition*. Wetlands International Global Series No. 12. Wageningen, The Netherlands.

OVERA-ARU WILDLIFE SANCTUARY

IN-JK-14

IBA Site Code : IN-JK-14

District : Anantnag

Coordinates : 34° 11' 18" N, 75° 18' 40" E

Ownership : State Wildlife Department

Area : 51,100 ha

Altitude : 2,100–5,425 msl

Precipitation : 700–800 mm + snowfall

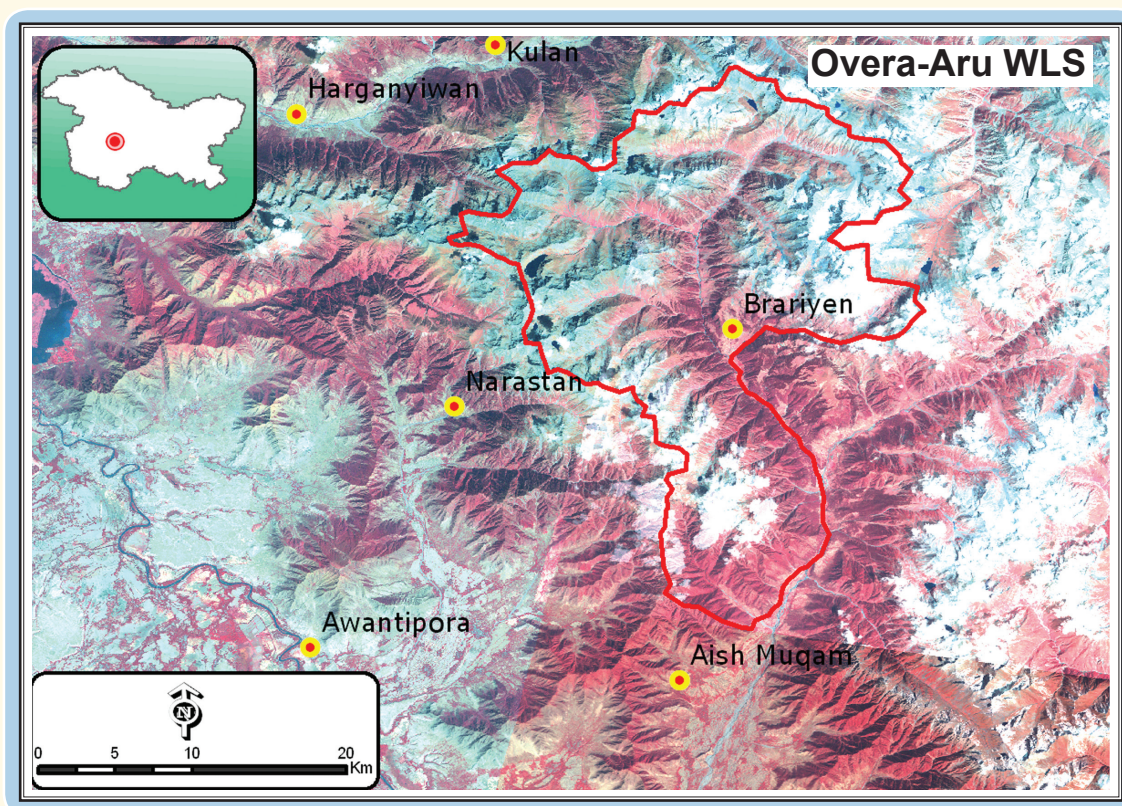
Temperature : -3 °C to 23 °C

Biogeographic Zone : Himalaya

Habitats : Himalayan Dry Temperate,
Himalayan Moist Temperate Mixed
Deciduous Forest, Moist Subalpine
Mixed Coniferous Forest,
Alpine Moist Scrub,
Alpine Dry Scrub,
Herbaceous Meadows

IBA CRITERIA : A1 (Threatened species), A2 (Endemic Bird Area 128: Western Himalaya),
A3 (Biome 5: Eurasian High Montane, Biome 7: Sino-Himalayan Temperate Forest)

PROTECTION STATUS : Wildlife Sanctuary, established in 1981.



GENERAL DESCRIPTION

Overa-Aru Wildlife Sanctuary is one of the most important protected areas of Jammu & Kashmir. It lies near the famous tourist resort of Pahalgam and falls within the distributional range of the Critically Endangered Kashmir Red Deer or Hangul *Cervus elaphus hanglu*, a viable population of which is at present found only in Dachigam National Park. It is linked with Dachigam through the Lidder Forest. Overa-Aru Wildlife Sanctuary is named after Overa Nullah that flows through it, and Aru, which is a favourite destination for trekkers (Suhail 2000).

Like many other sanctuaries of Jammu & Kashmir, Overa-Aru is historic, declared under Dogra rule in 1945. At that time, it covered only 32 sq. km, and later it was enlarged by 392 sq. km in 1981 when the Aru forest was included. The same order also designated the entire area as a 424 sq. km Biosphere Reserve under the UNESCO Man and Biosphere Programme. Finally, the State Government declared the whole area as a Wildlife Sanctuary (Suhail 2000).

Overa-Aru WLS is rich in a number of lakes (locally called *sar*) and glaciers which feed numerous streams and nullahs

ASAD R. RAHMANI



Overa was once famous for trekking, which yielded good income to the local people.
It can once again become popular for trekkers and birdwatchers

VULNERABLE

Kashmir Flycatcher *Ficedula subrubra*

NEAR THREATENED

Tytler's Leaf-warbler *Phylloscopus tytleri*

ENDEMIC BIRD AREA 128: WESTERN HIMALAYA

Tytler's Leaf-warbler *Phylloscopus tytleri*
Kashmir Flycatcher *Ficedula subrubra*
Kashmir Nuthatch *Sitta cashmirensis*
Orange Bullfinch *Pyrrhula aurantiaca*

BIOME 5: EURASIAN HIGH MONTANE (ALPINE AND TIBETAN)

Himalayan Griffon *Gyps himalayensis*
Himalayan Snowcock *Tetraogallus himalayensis*
Snow Pigeon *Columba leuconota*
Tickell's Warbler *Phylloscopus affinis*
Olivaceous Leaf-warbler *Phylloscopus griseolus* (?)

BIOME 7: SINO-HIMALAYAN TEMPERATE FOREST

Koklass Pheasant *Pucrasia macrolopha*
Himalayan Monal *Lophophorus impejanus*
Himalayan Pied Woodpecker *Dendrocopos himalayensis*
Streaked Laughingthrush *Garrulax lineatus*
Variegated Laughingthrush *Garrulax variegatus*
Rusty-tailed Flycatcher *Muscicapa ruficauda*
Slaty-blue Flycatcher *Ficedula tricolor*
Fire-capped Tit *Cephalopyrus flammiceps*
Simla Crested Tit *Parus rufonuchalis*
Rufous-bellied Crested Tit *Parus rubidiventris*
Spot-winged Crested Tit *Parus melanolophus*
Greenbacked Tit *Parus monticolus*
Bar-tailed Treecreeper *Certhia himalayana*
Yellow-breasted Greenfinch *Carduelis spinoides*

that flow through the villages situated near the periphery of the sanctuary. With a pre-Independence tradition of conservation awareness, the Government of Jammu & Kashmir keenly protects Overa-Aru as a source of water for drinking and irrigation.

The following vegetation types can be distinguished in Overa: Riverine or Deciduous forest below 2,300 msl, with Horse Chestnut *Aesculus indica* and Walnut *Juglans regia* dominant, with other riparian associates, such as Ash *Fraxinus* sp., Mulberry *Morus alba*, *Robinia* sp., Himalayan Elm *Ulmus wallichiana*, Himalayan Bird Cherry *Padus cornuta*, Wax tree *Rhus succedanea*, and Rowan *Pyrus lanata*; Coniferous forest from 2,300 to 3,000 msl, dominated by Silver Fir *Abies pindrow* on moist aspects and Blue Pine *Pinus wallichiana* on dry aspects. Other associates are *Picea smithiana*, and *Ulmus wallichiana*; Alpine or Birch forest is found from 3,000 to 3,500 msl, dominated by Silver Birch *Betula utilis*, and associated with *Rhododendron campanulatum* and *Juniperus* spp. The ground cover comprises herbs such as *Rumex patientia*, *Primula*, *Pedicularis*, *Anemone*, and *Corydalis*. The alpine scrub and rocky faces, from 3,500 to 3,800 msl, bear *Juniperus recurva* and *Rhododendron anthopogon*, and herb species *Stachys sericea*, *Sieversia elata*, and *Veronica melissaefolia* (Suhail 2000).

AVIFAUNA

Of 119 bird species recorded in and around Overa Sanctuary by Price & Jamdar (1990) and Price *et al.* (2003), 89 species were recorded breeding within its boundaries.

Recently, Intesar Suhail (*pers. comm.* 2003) reported 113 species of birds, including new records. Both Himalayan Monal *Lophophorus impejanus* and Koklass Pheasant *Pucrasia macrolopha* are present, but the Western Tragopan *Tragopan melanocephalus* has not been seen. It is distributed along the Pir Panjal range opposite the Zaskar range, within which Over-Aru WLS falls (Rodgers & Panwar 1988).

Price & Jamdar (1989, 1990, 1991; Price *et al.* 2003) found eight species of sympatric warblers breeding in Overa. They are Tytler's Leaf-warbler *Phylloscopus tytleri*, Tickell's Leaf-warbler *P. affinis*, Orange-barred Leaf-warbler *P. pulcher*, Hume's Yellow-browed Warbler *P. humei*, Pallas's Leaf-warbler *P. chloronotus*, Large-billed Leaf-warbler *P. magnirostris*, Greenish Leaf-warbler *P. trochiloides*, and Large-crowned Leaf-warbler *P. occipitalis*. In addition, the Strong-footed Bush-warbler *Cettia fortipes* is common. A survey in June 2011 by Trevor Price (*pers. comm.*) revealed that the Greenish Leaf-warbler has apparently disappeared from the sanctuary. However, Whistler's Warbler *Seicercus whistleri*, which was recorded only rarely in the 1980s (Price *et al.* 2003), was common at 3,100–3,400 msl in the Rhododendron and Juniper scrub. In 2011 too, the Ashy-sided Bush-warbler *Cettia brunnifrons* was quite common in open areas above 3,100 msl (Trevor Price, *pers. comm.* 2011), whereas it was not recorded in the earlier surveys.

Jamdar & Price (1990) found that the Simla Black Tit *Parus rufonuchalis* and Rufous-bellied Crested

Tit *P. rubidiventris* breed sympatrically in Overa. A third Biome 7 species, Crested Black Tit *Parus melanolophus* is abundant in the Fir forest (Price & Jamdar 1990).

Overa-Aru is located in the Western Himalaya Endemic Bird Area (EBA 128) where Stattersfield *et al.* (1998) have listed 11 restricted-range species, four of which have been found here, though more are likely to occur.

Overa has two biomes: Biome 5 (Eurasian High Montane – Alpine and Tibetan) above c. 3,600 msl, and Biome 7 (Sino-Himalayan Temperate Forest) from c. 1,800 to 3,600 msl. BirdLife International (undated) has prepared a list of biome species. Out of the 48 Biome 5 species, five are found here. Similarly, 15 species of Biome 7 are found out of the 112 listed by BirdLife International.

The only globally Threatened species in this IBA is the Kashmir Flycatcher *Ficedula subrubra*. It has a small breeding range in the Northwest Himalaya, so it is also considered as a restricted-range species by BirdLife International (2001). Between 1985 and 1987, 17 Kashmir Flycatchers were caught for ringing (Price & Jamdar 1990). Kashmir Flycatcher is quite often seen in the lower reaches of the Sanctuary in breeding plumage.

During his visits to Overa-Aru in the early 1980s, Trevor Price (*pers. comm.* 2012) found Orange Bullfinch *Pyrrhula aurantiaca* very common, but during his recent visits (2008, 2011, 2012) totalling about six weeks, he could not find any in the sanctuary. On the other hand, he found Rusty-tailed Flycatcher *Muscicapa ruficauda* to be much more common than it was in the 1980s.



ANANT ZANJALE

Mistle Thrush *Turdus viscivorus* is one of the inhabitants of Overa-Aru



CLEMENT FRANCIS

Kashmir Flycatcher *Ficedula subrubra* a globally Threatened species that breeds in Overa-Aru Sanctuary


 Montane habitat of the Tytler's Leaf-warbler *Phylloscopus tytleri*

OTHER KEY FAUNA

About 20 large and medium mammals are found in Overa (Suhail 2000). Kashmir Red Deer or Hangul *Cervus elaphus hanglu* is the commoner and better known of the two races of European Red Deer *Cervus elaphus* found within Indian limits (Prater 1980). Kurt (1978) estimated about seven Hangul. The presence of Hangul was also confirmed by the latest census conducted by the South Kashmir Wildlife Division, Department of Wildlife Protection. A total of 11 Hangul (3 males, 6 females, 2 fawns) were seen inside the Sanctuary (Suhail 2000). Indirect evidence (droppings and hoof-marks) shows that the Hangul is fairly well distributed in this area. In winter, it moves to Hakarhaji, Poshpathri, Gumri, and Kanjkoot areas, while in summer it ascends to the higher areas of Chhumani and Munwarsar (Suhail 2000). In 2003, only four Hanguls were sighted (R.Y. Naqash, *pers. comm.*). In May 2003, Khursheed Ahmad sighted two Hangul females around the Kanjkot area of Overa, whereas in April 2006, two female Hangul with a yearling were recorded in the Overa Sanctuary (Khursheed Ahmad, *unpubl.* 2011). Trevor Price in June 2008 and again in June 2011, sighted at least three Hangul in the Kanjkot area (Trevor Price, *pers. comm.* 2011).

The Musk Deer *Moschus chrysogaster* is found in the higher reaches of the sanctuary; one was sighted by Trevor Price in June 2011. The exact number is not known as it is elusive and crepuscular. Brown Bear *Ursus arctos*

is uncommon, and confined to higher mountains such as Kolahai. The Himalayan Black Bear *U. thibetanus* is much more common all over the sanctuary. As it raids crops, particularly maize, it is a problem in some areas. Snow Leopard *Panthera uncia* has not been reported from Overa-Aru, but the Leopard *Panthera pardus* is fairly common in and around lower reaches.

According to the separation of Common Langur into seven species by Groves (2001), the species found in Overa-Aru would be *Semnopithecus schistaceus*, named Nepal Langur by him.

Yellow-throated Marten *Martes flavigula*, Red Fox *Vulpes vulpes*, Jungle Cat *Felis chaus*, and Leopard Cat *Prionailurus bengalensis* are some of the smaller predators likely to be present.

Not much is known about the reptile and fish fauna. Suhail (2000) listed 18 species of butterflies, including four rare species listed in the IUCN Red Data Book.

LAND USE

- Human settlement
- Nature conservation and research
- Ecotourism and recreation

THREATS AND CONSERVATION ISSUES

- Deforestation
- Bush fires

- Unrestricted tourism
- Grazing by livestock
- Firewood collection

Overa-Aru WLS provides a spectacular backdrop for Kashmir's famous tourist spot, Pahalgam. In order to preserve Pahalgam, it is necessary to protect the forest all around it, and the best way is to provide it sanctuary status.

Overa, Lardi, and Dahwatoo villages, with a total human population of nearly 4,500, are situated close to the southern boundary of the sanctuary, so constant vigil is required to prevent encroachment. Overa-Aru suffers severe grazing pressure during summer from the livestock of local people in the lower reaches and nomadic graziers who come up mostly from Jammu. Firewood collection is another major problem due to increase in the human population in recent decades. Many villagers around Overa use cooking gas, but Gujjar settlements and some villagers in and along the valley have to stock huge amounts of fuel wood to last through winter. Fires during the summer are another problem. These fires are often started by graziers to remove dry, unpalatable, coarse grasses.

In order to maximize the potential of Overa-Aru for Hangul and other wildlife, the Department of Wildlife Protection (Suhail 2000) suggested the following measures: (i) massive afforestation with fruit bearing trees and wild species; (ii) fire line development in six compartments; (iii) fencing in certain areas to prevent entry of livestock; (iv) waterhole development in certain areas (e.g., Satragi, Gumri, Kopra) that suffer scarcity of water and are frequented by Hangul; (v) research and monitoring; (vi) compensation for damage to livestock or crops by wild animals; (vii) publicity and awareness by establishing nature clubs at Aru and Veersiran villages; and (viii) promotion of well-managed ecotourism, nature trekking, birdwatching, and rock climbing.

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Nitin Jamdar, Intesar Suhail, R.Y. Naqash, Trevor Price, Khursheed Ahmad.

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GAURAV SHARMA

Plumbeous Water Redstart *Rhyacornis fuliginosa* is a good indicator of clear, unpolluted hill streams

Groves, C. (2001) *Primate Taxonomy*. Smithsonian Institution Press, Washington, DC.

Jamdar, N. and Price, T. (1990) Simla Black Tit *Parus rufonuchalis* and Rufousbellied Crested Tit *Parus rubidiventris* breeding sympatrically in Kashmir. *J. Bombay Nat. Hist. Soc.* 87: 302–303.

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PANGONG TSO

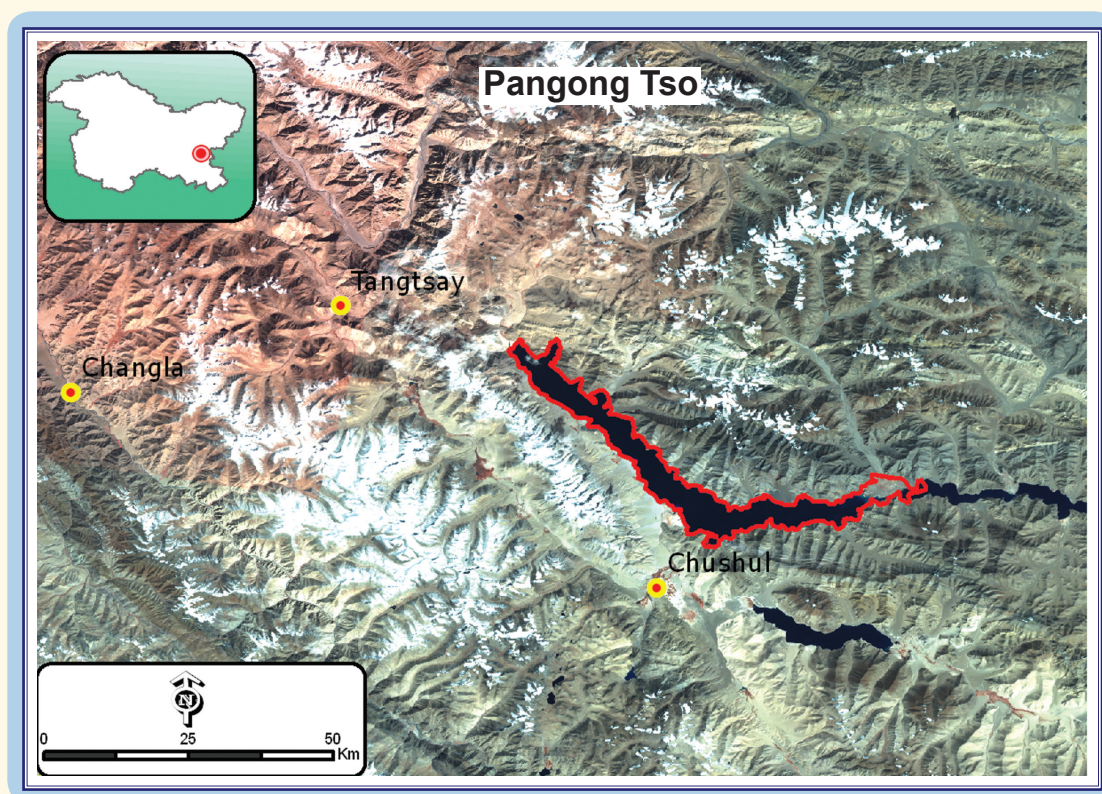
IN-JK-15

IBA Site Code	: IN-JK-15
District	: Leh, Ladakh
Coordinates	: 33° 49' 60" N, 78° 34' 60" E
Ownership	: State
Area	: 65,000 ha (1/3 in India, the rest in China)
Altitude	: 4,218 msl

Precipitation	: 76 mm + snowfall
Temperature	: -40 °C to 30 °C
Biogeographic Zone	: Trans-Himalaya
Habitats	: Marshes, Deepwater, Brackish Sandy Mudbanks, Brackish Saline Marshes, Wet Meadows

IBA CRITERIA : A1 (Threatened Species), A3 (Biome 5: Eurasian High Montane)

PROTECTION STATUS : Wetland is part of the Changthang Cold Desert Wildlife Sanctuary, also declared a wetland conservation reserve by the Department of Wildlife Protection, J&K Government.



GENERAL DESCRIPTION

Pangong Tso is a long, narrow, brackish lake spanning the India-China border, in a valley in the upper drainage basin of the River Indus, at the east end of the Karakoram range. Only the westernmost one-third of the lake lies in Indian territory. It is a chain of four interconnecting lakes, formed by natural damming of the valley. Five streams fed by perennial springs and snowmelt flow into the Indian portion of the lake. There is no outlet for this lake on the Indian side. There are some brackish to saline marshes near the western end, with adjacent wet meadows.

The lake has been proposed as a Ramsar Site due to its biological, cultural, and geological values (Chatterjee *et al.*

2002, Islam & Rahmani 2008) and its role in the hydrology of the region. It is the largest and most brackish wetland in the cold desert ecosystem of the Trans-Himalaya. A fossil freshwater mollusc *Lymnaea auricularia* (= *Radix auricularia*) was discovered in ancient lacustrine clay deposits above the present level of the lake, providing evidence that earlier it was a freshwater lake (Sharma 2000).

Due to its extreme salinity, Pangong Tso does not have any vegetation in the deeper parts, but the margins and marshy areas bear typical steppe vegetation. Sedges and other grasses are found towards the northern and eastern sides. The surrounding plateau and hills support low thorn scrub and perennial herbs.

VULNERABLE

 Black-necked Crane *Grus nigricollis*

 BIOME 5: EURASIAN HIGH MONTANE
(ALPINE AND TIBETAN)

Himalayan Griffon	<i>Gyps himalayensis</i>
Tibetan Snowcock	<i>Tetraogallus tibetanus</i>
Himalayan Snowcock	<i>Tetraogallus himalayensis</i>
Tibetan Partridge	<i>Perdix hodgsoniae</i>
Solitary Snipe	<i>Gallinago solitaria</i>
Ibisbill	<i>Ibidorhyncha struthersii</i>
Tibetan Sandgrouse	<i>Syrrhaptes tibetanus</i>
Snow Pigeon	<i>Columba leuconota</i>
Long-billed Calandra-Lark	<i>Melanocorypha maxima</i>
Rosy Pipit	<i>Anthus roseatus</i>
Yellow-billed Chough	<i>Pyrrhocorax graculus</i>
Alpine Accentor	<i>Prunella collaris</i>
Robin Accentor	<i>Prunella rubeculoides</i>
Brown Accentor	<i>Prunella fulvescens</i>
Stoliczka's Tit-warbler	<i>Leptopoeile sophiae</i>
Guldenstadt's Redstart	<i>Phoenicurus erythrogaster</i>
Grandala	<i>Grandala coelicolor</i>
Tickell's Leaf-warbler	<i>Phylloscopus affinis</i>
Olivaceous Leaf-warbler	<i>Phylloscopus griseolus</i>
Wallcreeper	<i>Tichodroma muraria</i>
Tibetan Snowfinch	<i>Montifringilla adamsi</i>
Black-headed Mountain-finch	<i>Leucosticte brandti</i>
Streaked Rosefinch	<i>Carpodacus rubicilloides</i>
Red-fronted Rosefinch	<i>Carpodacus puniceus</i>
Great Rosefinch	<i>Carpodacus rubicilla</i>
Plain-backed Snowfinch	<i>Pyrgilauda blanfordi</i>
Hodgson's Mountain-finch	<i>Leucosticte nemoricola</i>

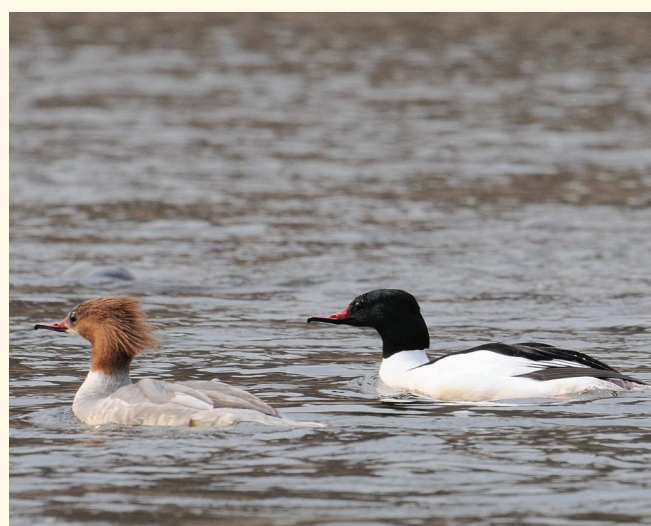
AVIFAUNA

Pangong Tso is an important breeding area for a variety of waterfowl, including Ruddy Shelduck *Tadorna ferruginea*. Migratory Bar-headed Goose *Anser indicus* occurs in significant numbers on passage. It is also a significant staging ground during the autumn migration.

Although the Black-necked Crane *Grus nigricollis* does not breed here (Pfister 1998), a nearby wetland in Chushul is a very well-known breeding and staging area, with three to four breeding pairs. Pangong Tso is their staging and foraging ground, especially the marshes on the fringe of the lake (Chandan 2014). During a survey in 2012 and 2013, two pairs of Black-necked Crane were seen foraging in the marshes adjoining Pangong Lake (Chandan 2014).

OTHER KEY FAUNA

The surrounding hills and plateau support a rich assemblage of Himalayan and Tibetan wildlife, including the Wild Ass *Equus kiang*, Snow Leopard *Panthera uncia*, Great Tibetan Sheep *Ovis ammon hodgsoni*, Blue Sheep *Pseudois nayaur*, Tibetan Wolf *Canis lupus chanku*, and Red Fox *Vulpes vulpes*. Plateau Pika *Ochotona curzoniae*,



ANANT ZANJALE

Goosander *Mergus merganser* is seen mainly in the streams emptying into Pangong Lake

Stoliczka's Mountain Vole *Alticola stoliczkanus*, and Himalayan Marmot *Marmota bobak* are very common, and form the main prey for smaller carnivores and raptors.

LAND USE

- Livestock grazing
- Nature conservation and research
- Tourism and recreation

THREATS AND CONSERVATION ISSUES

- Overgrazing
- Unrestricted tourism
- Construction of guest houses and other tourism-related infrastructure at the northern edge of the lake.

The State Government intends to declare an area of 400,000 ha in eastern Ladakh as a High Altitude Cold Desert National Park. The existing Pangong Reserve would be incorporated within this national park.

Local people graze their yaks and horses on the marshes and meadows, and harvest the grasses for fodder. The current level of grazing already exceeds the carrying capacity of the land, and is resulting in soil erosion. Domestic livestock cause some disturbance to nesting birds. The local people, being Buddhist, do not kill cranes or any wildlife, but their livestock graze very close to the nesting birds. This could be regulated through their cooperation.

KEY CONTRIBUTORS

Otto Pfister, Pankaj Chandan, Rashid Raza, S.A. Hussain, Bivash Pandav, Tsewang Namgail.

KEY REFERENCES

- Chatterjee, A., Chandan, P., Gautam, P., and Droz, B.H. (2002) *High Altitude Wetlands of Ladakh: A Conservation Initiative*. WWF-India, New Delhi. Pp. 38.



PANKAJ CHANDAN

Pangong - Tso is famous for breeding populations of Brown-headed Gull, Great Crested Grebe, Ruddy Shelduck, Bar-headed Goose and other species

Chandan, P. (2014) Breeding biology and Ecology of Black-necked Crane in Selected High Altitude Wetlands of Ladakh, India. Ph.D Thesis. Aligarh Muslim University, Aligarh. 245 pp.

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KHURSHED AHMAD

Large numbers of Bar-headed Geese breed in and around Pangong Tso. Sometimes two or three families together for foraging as seen above

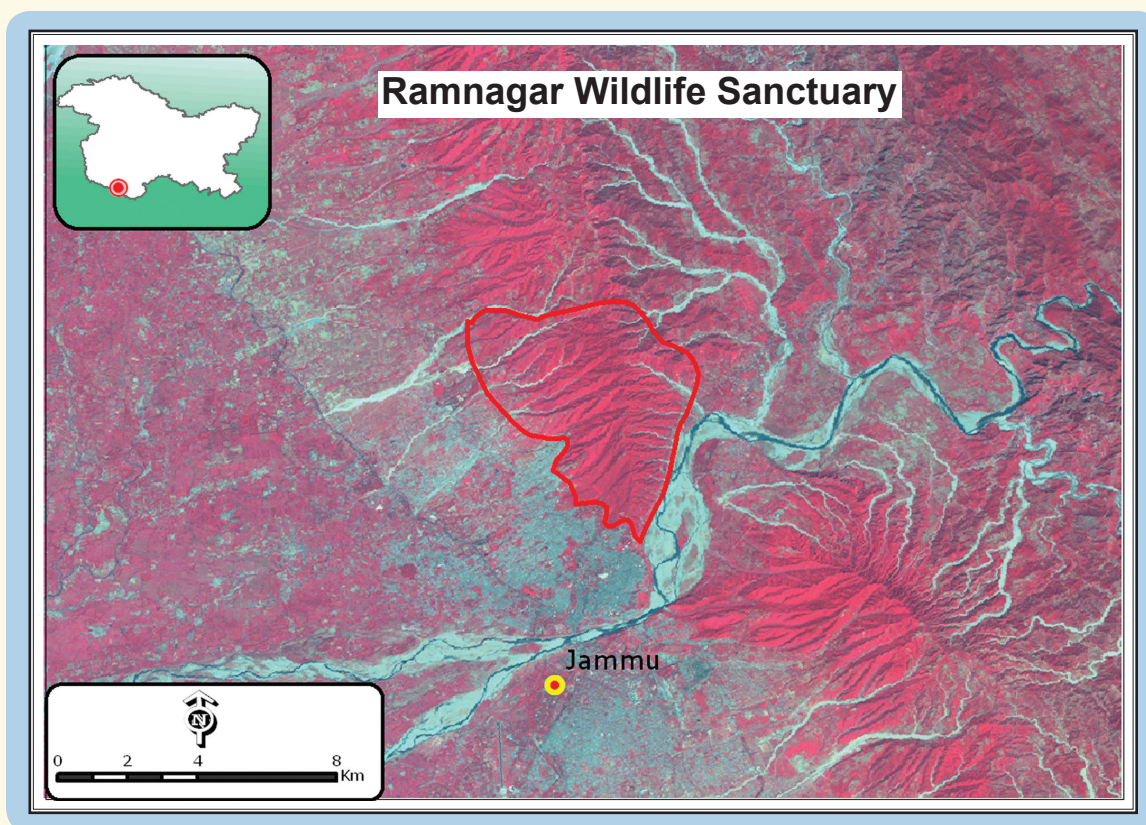
RAMNAGAR WILDLIFE SANCTUARY

IN-JK-16

IBA Site Code	: IN-JK-16	Altitude	: 400–800 msl
District	: Jammu	Rainfall	: 1,100 mm
Coordinates	: 32° 44' 48" N, 74° 52' 00" E	Temperature	: 5 °C to 46 °C
Ownership	: State	Biogeographic Zone	: Semi-arid
Area	: 1,275 ha	Habitats	: Tropical Dry Deciduous Forest

IBA CRITERIA : A1 (Threatened Species) Biome 7: Sino-Himalayan Subtropical Forest

PROTECTION STATUS : Wildlife Reserve Area OR Sanctuary, established in 1987.



GENERAL DESCRIPTION

This is a very old sanctuary, established on Ramnagar ridge as a reserve by the erstwhile Maharaja of Kashmir over five decades ago. It is situated north of Jammu city, with the Jammu-Srinagar national highway passing through its eastern side. The sanctuary is located in the Kar Nullah which ultimately drains into Tawi river. The topography ranges from gently undulating terrain to very steep cliffs. The forest is a part of the Lower Shivaliks, hence it is important for many biome-restricted species. The shrine of Mata Vaishno Devi is located close to the sanctuary, and visited by millions of pilgrims, though most of the visitors are unaware that they are near a wildlife sanctuary.

There is a Mini Zoo on the edge of the sanctuary, and a frequently used path through it provides an important

recreational area for many residents of Jammu city.

The area is covered with mixed scrub forest. The vegetation of the sanctuary, according to the revised classification of Champion & Seth (1968) comes under the major group Subtropical Northern Mixed Dry Deciduous Forest. A variety of Subtropical Broadleaf trees and shrubs are found in the sanctuary, dominant among them being *Acacia modesta*. Some other plant species are *Acacia arabica*, *A. catechuoides*, *Adhatoda vasica*, *Haldina cordifolia*, *Aegle marmelos*, *Albizia lebbeck*, *Bauhinia purpurea*, *Bombax ceiba*, *Dalbergia sissoo*, and *Ziziphus mauritiana*.

AVIFAUNA

Based on preliminary investigations, 37 species of birds are reported from this sanctuary. Among pheasants,



GARIMA BHATIA

Five to six species of vultures are found in Ramnagar WLS. Seen above are (L-R) Egyptian, White-rumped, Griffon, and Himalayan Vultures

Red Junglefowl *Gallus gallus*, Kaleej Pheasant *Lophura leucomelanos*, and Peafowl *Pavo cristatus* are notable. Grey Francolin *Francolinus pondicerianus* is quite common. Trevor Price (*pers. comm.*) surveyed two five-hectare grids established at 500 msl (in 2009) and 700 msl (in 2011) and recorded a total of 30 breeding species in these grids, including Orange-headed Ground-thrush *Zoothera citrina* and Blue-throated Flycatcher *Cyornis rubeculoides*. Indian Pitta *Pitta brachyura* is likely to breed here (Trevor Price, *pers. comm.* 2011). The species of conservation interest are White-rumped Vulture *Gyps bengalensis* and Slender-billed Vulture *G. tenuirostris*. This site was selected as an IBA as it is a potential habitat for Sino-Himalayan Subtropical Forest biome species. In India, it is the westernmost expanse of this type of forest.

OTHER KEY FAUNA

The dry deciduous forest of Ramnagar harbours Leopard *Panthera pardus* as the major predator, which survives despite disturbance due to its nocturnal habit and elusive nature. Its main natural prey species are Barking Deer *Muntiacus muntjak*, Cheetal *Axis axis*, Wild Boar

CRITICALLY ENDANGERED

White-rumped Vulture	<i>Gyps bengalensis</i>
Slender-billed Vulture	<i>Gyps tenuirostris</i>

Sus scrofa, and Nilgai *Boselaphus tragocamelus*. Golden Jackal *Canis aureus* and Jungle Cat *Felis chaus* are smaller predators. Non-human primates recorded are Rhesus Macaque *Macaca mulatta* and Common Langur, which according to Groves (2001) would be Himalayan Grey Langur *Semnopithecus ajax*.

LAND USE

- Nature conservation
- Recreation

THREATS AND CONSERVATION ISSUES

- Livestock grazing
- Encroachment
- Wildlife-livestock conflict

Overgrazing by livestock is a major problem, and the pressure increases during winter when nomadic Gujjars and

Bakerwals come down from the higher reaches with herds of goat and sheep. Although, to provide food to goats, lopping of palatable species is rampant, the sanctuary is reasonably well protected. But this results in total degradation of the surrounding forest. As the sanctuary is close to the growing Jammu city, it is under constant threat from encroachment. Due to degradation of the habitat, streams run dry just after the monsoon. There is no natural source of water as most of the pools have silted up or have been reclaimed and occupied by itinerant graziers. Fortunately, the Forest Department is able to control incidents of fire and poaching.

The sanctuary is almost entirely surrounded by villages, especially on its northern side, and Jammu city to the south. Ecodevelopment activities need to be initiated to reduce anthropogenic pressure on the forest resources (Hussein 1999–2000). The villagers should also be involved in joint forest management.

Thousands of people enjoy walking in the sanctuary every day, but they do not contribute to its upkeep in any way. However, some argue that the more people that visit the sanctuary, the better it would be protected. The visitors could be asked to pay and get involved in its protection.

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Tahir Shawl, Trevor Price, Khursheed Ahmad.

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- Groves, C. (2001) *Primate Taxonomy*. Smithsonian Institution Press, Washington, DC.
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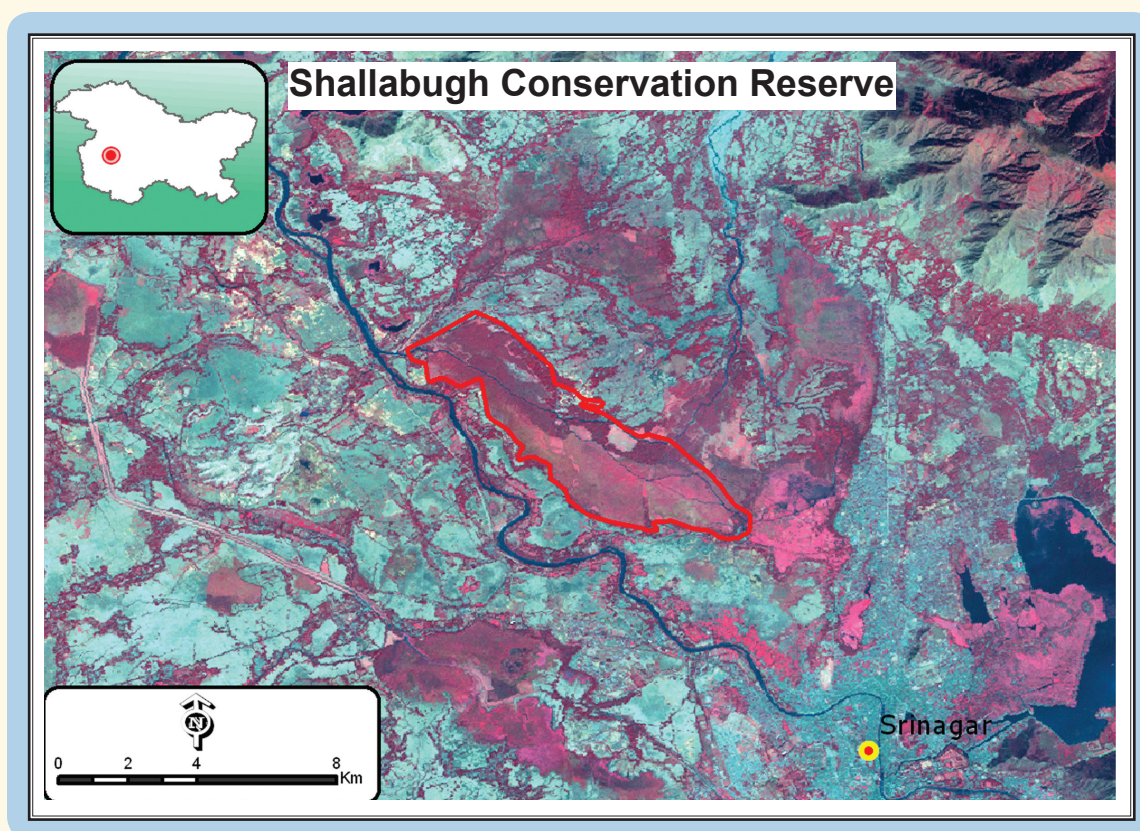
SHALLABUGH CONSERVATION RESERVE

IN-JK-17

IBA Site Code	: IN-JK-17	Altitude	: 1,580 msl
District	: Srinagar	Precipitation	: 550 mm + snowfall
Coordinates	: 34° 10' 00" N, 74° 42' 00" E	Temperature	: -2 °C to 35 °C
Ownership	: State	Biogeographic Zone	: Himalaya
Area	: 700 ha	Habitats	: Freshwater Swamp, Himalayan Secondary Scrub

IBA CRITERIA : A4iii (>20,000 waterbirds)

PROTECTION STATUS : Wetland Conservation Reserve.



GENERAL DESCRIPTION

Close to Srinagar city in the Kashmir Valley lie the Shallabugh marshes. They are fed by the Sindh river and local snowmelt. The depth of the water varies from 0.3 to 2.0 m, and the water level fluctuates considerably according to the rainfall and snowmelt. Large areas of the lake dry up between September and March.

The area has extensive reedbeds of *Phragmites communis* and *Typha angustata*, and rich growth of *Nymphaea candida* and *N. stellata* on open water. *Lemna* sp. forms mats over the surface in some areas, while adjacent areas have willow plantations and paddyfields. The area is thus of great importance for waterfowl.

Islam & Rahmani (2008) have proposed Shallabugh

Conservation Reserve as a Ramsar Site as it qualifies for Ramsar Criterion 5 (wetland regularly supports 20,000 or more waterbirds) and Criterion 6 (wetlands regularly supports 1% of the individuals in a population of one species or subspecies). It is Ramsar Wetland Type O (permanent freshwater lake).

AVIFAUNA

The area is an important staging and wintering ground for migratory Anatidae, and breeding area for a variety of waterfowl, particularly Mallard *Anas platyrhynchos*. Over 150,000 ducks and geese have been recorded at one time (Rashid Naqash, *pers. comm.* 2003). The site qualifies for A4iii criteria. Detailed studies have not been conducted, but



Thousands of waterbirds congregate at Shallabugh and use this wetland as a stop-over during the migration

the available information shows that it attracts species such as Common Teal *Anas crecca*, Northern Pintail *A. acuta*, Eurasian Wigeon *A. penelope*, Mallard *A. platyrhynchos*, Garganey *A. querquedula*, Gadwall *A. strepera*, Northern Shoveller *A. clypeata*, Common Pochard *Aythya ferina*, White-eyed or Ferruginous Pochard *A. nyroca*, and Red-crested Pochard *Netta rufina*. Many species breed in the extensive marshes, but detailed records are not available. More recent records of sightings of huge concentrations of these species in 2008–2009 at the end of January and

throughout February in Shallabugh Wetlands are available (Khursheed Ahmad, *unpubl.*).

During a recent visit of IBCN members headed by Dr. Asad Rahmani to Shallabugh Wetland on February 23, 2012, a population of nearly 500,000 waterfowl was recorded.

A similar number of birds was estimated during the recent Asian Waterfowl Count conducted by the Wildlife Department in February 2012 in Shallabugh Wetland Reserve (Rauf Zargar, *pers. comm.* 2012).

OTHER KEY FAUNA

The only major mammal is the Common Otter *Lutra lutra* which is found in almost all the large wetlands of the Kashmir Valley. Red Fox *Vulpes vulpes* and Golden Jackal *Canis aureus* are found in the surrounding agricultural land and forests. These marshes are also rich in fish fauna, but not much specific information is available.

LAND USE

- Agriculture
- Fisheries

THREATS AND CONSERVATION ISSUES

- Siltation
- Agricultural intensification and expansion
- Use of fertilizers and pesticides
- Illegal grazing and encroachment



It is important to make local communities, particularly children, interested in wildlife. Bringing them to IBAs such as Shallabugh can generate interest



ASAD R. RAHMANI

There has been a steady increase in the number of waterfowl, thanks to effective protection by the J&K Wildlife Department. Shallabugh Conservation Reserve is a good example of such protection

Like other wetlands of the Kashmir Valley, Shallabugh suffers from overfishing, infestation by weeds, and pollution. Besides the usual anthropogenic pressures and threats, biomedical waste from the Sher-e-Kashmir Institute of Medical Sciences disposed of in Anchar ends up in Shallabugh. However, the entire wetland is protected as a conservation reserve by the Department of Wildlife Protection, Government of Jammu & Kashmir.

The surrounding areas are almost entirely agricultural. The principal threats are siltation, eutrophication, and encroachment for agriculture. Fertilizer run-off from the adjacent agricultural land has greatly increased the rate of

eutrophication. Pesticide pollution through runoff from the agricultural lands may pose a serious threat to the breeding and wintering waterbirds. This needs investigation.

KEY CONTRIBUTORS

Rashid Y. Naqash, Khursheed Ahmad, Intesar Suhail.

KEY REFERENCE

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TSO KAR BASIN

IN-JK-18

IBA Site Code : IN-JK-18

District : Leh, Ladakh

Coordinates : 33° 17' 60" N, 78° 00' 00" E

Ownership : State

Area : 10,000 ha

Altitude : 4,530 msl

Precipitation : 70 mm + snowfall

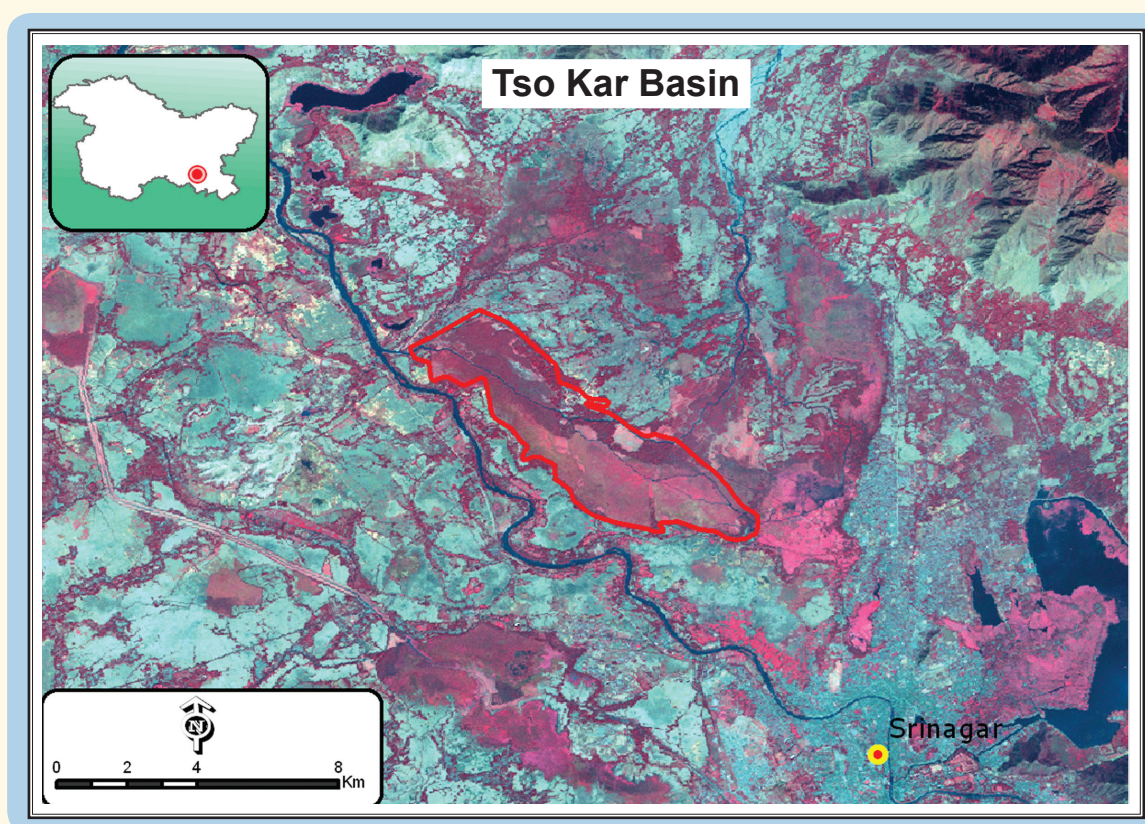
Temperature : -40 °C to 35 °C

Biogeographic Zone : Trans-Himalaya

Habitats : Aquatic

IBA CRITERIA : A1 (Threatened species)

PROTECTION STATUS : Wetland is part of the Changthang Cold Desert Wildlife Sanctuary, also declared as a wetland conservation reserve by the Department of Wildlife Protection, J&K Government.



GENERAL DESCRIPTION

Tso Kar Basin originated from a former large freshwater lake (Chatterjee *et al.* 2002). It lies between the Zaskar range to its southwest and the Ladakh range to the northeast, south of the River Indus. The basin forms part of the proposed 400,000 ha High Altitude National Park in eastern Ladakh. The waterspread has contracted into two principal waterbodies, Startsapuk Tso, a freshwater lake of c. 300 ha to the south, and Tso Kar itself, a hypersaline lake with an area of 2,200 ha to the north. The lakes remain completely frozen from December to April. Startsapuk Tso is fed by perennial springs and snow, and attains a maximum depth of 3 m in July and August, when it overflows

northwards into Tso Kar. The basin is surrounded by peaks rising over 6,000 msl.

The presence of freshwater mollusc *Lymnaea auricularia* (= *Radix auricularia*) fossils proves that it was a freshwater lake in the past (Sharma 2000). The original freshwater lake measured nearly 13,600 ha.

In the less saline parts of the basin, the pools have aquatic vegetation including *Potamogeton* and *Hydrilla* spp. These plants die in winter, and form floating mats of vegetation in spring. The adjacent freshwater marshes and damp meadows support a mixture of *Carex* and *Ranunculus* spp. The arid steppe vegetation of the surrounding areas is dominated by *Astragalus* and *Caragana* spp. About 232 plant species



Tso Kar is a breeding ground for local birds and staging ground for thousands of migratory birds

have been recorded in Tso Kar Basin and Marshes (Nisa Khatoon, *pers. comm.* 2007). The site easily qualifies for Ramsar Criterion 2 (wetland supports threatened ecological communities) as it supports the Vulnerable Black-necked Crane *Grus nigricollis*, therefore it has been suggested as a Ramsar Site (Islam & Rahmani 2008). According to Ramsar classification the wetland is Type O (permanent freshwater lake) and Type Ss (seasonal saline pools and marshes).

AVIFAUNA

Tso Kar Basin is one of the most important breeding areas of the Vulnerable Black-necked Crane *Grus nigricollis* in India (Pfister 1998). Otto Pfister (*pers. comm.* 2003) observed two breeding attempts, one in 1996 near its eastern shore (one egg), and again in 1997 at the northern shore (two eggs), but both nests were flooded due to rising water levels by the end of June. In 2002, a nest with two eggs was found in the northeastern part of Tso Kar Lake, but the eggs were lost due to unknown reasons. A breeding pair near Startsapuk Tso has been more successful in raising two chicks each in 2000 and 2001, and was found breeding in 2002 and also during following years till 2013 (Chandan 2014). At present, three pairs of Black-necked Crane regularly breed in this area (Chandan 2014).

This IBA is also the major breeding area for Great Crested Grebe *Podiceps cristatus*, Bar-headed Goose *Anser indicus*, Ruddy Shelduck *Tadorna ferruginea*, Brown-headed Gull *Larus brunnicephalus*, and Common Tern *Sterna hirundo*. Namgail *et al.* (2009) counted 281 Bar-headed Goose in Startsapuk Tso in late July. However, there were

only 30 Bar-headed Goose in Tso Kar, due perhaps to its brackishness. The distribution pattern was the opposite for the omnivorous Ruddy Shelduck, which was more abundant in Tso Kar (350 individuals) and less in Startsapuk Tso (179 individuals). During autumn migration, the Tso Kar Basin becomes an assembling ground for local breeding birds as well as a major staging ground for migratory birds, and congregations of thousands of birds can be observed. In 2013 and 2014, the breeding of Saker Falcon *Falco cherrug milvipes* at Tso Kar was recorded for the first time (Pankaj Chandan, *pers. comm.* November 2014). This is the first ever breeding record of Saker Falcon in India.

OTHER KEY FAUNA

Wild Ass *Equus kiang* and Tibetan Argali *Ovis ammon hodgsoni* forage on the slopes and meadows, while Himalayan Blue Sheep *Pseudois nayaur* grazes in the more rugged areas. Tibetan Wolf *Canis lupus* and Red Fox *Vulpes vulpes* occur in the surrounding plains. In addition, evidence of the Endangered Snow Leopard *Panthera uncia* and Lynx *Lynx isabellina* have been recorded from the area on many occasions. The meadows around the lake are also grazed by the Himalayan Marmot *Marmota bobak*, and several other small mammalian herbivores like pikas and voles.

LAND USE

- Tourism and recreation
- Nature conservation and research
- Livestock grazing

THREATS AND CONSERVATION ISSUES

- Overgrazing by livestock
- Unrestricted tourism
- Unsustainable removal of aquatic vegetation

A major threat to the wetland comes from intensification of grazing between November and May, particularly by sheep, horses, and yak. The nomads leave the basin in May to return in November. Earlier, the area used to remain undisturbed from June to October, coinciding with the breeding season of the Black-necked Crane. Grasses were allowed to grow, and were harvested only in October. Due to increase in human and livestock populations, traditional land use is being disturbed, putting increasing pressure on the marshes and grazing lands.

Tso Kar Basin lies within the boundaries of the proposed High Altitude National Park (400,000 ha) in eastern Ladakh. The greatest long-term threat to it comes from unregulated tourism, which brings in non-degradable garbage (Rauf Zargar, *pers. comm.* 2003). This can be tackled only through strong legislation and implementation of ecotourism guidelines. Regulated ecotourism and the home stay concept need to be promoted as they can go a long way to help conserve biodiversity of the IBA and provide economic upliftment to the local communities.

KEY CONTRIBUTORS

Otto Pfister, Pankaj Chandan, Rauf Zargar, Nisa Khatoon, Khursheed Ahmad, Tsewang Namgail.

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PANKAJ CHANDAN

Tso Kar is a part of Changthang Cold Desert Wildlife Sanctuary and one of the most important breeding areas of Black-necked Crane

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PANKAJ CHANDAN

Sometimes more than twenty Black-necked Crane are seen in the marshes of Tso Kar Lake, but only three pairs breed in this IBA

TSO MORIRI LAKE AND ADJACENT MARSHES

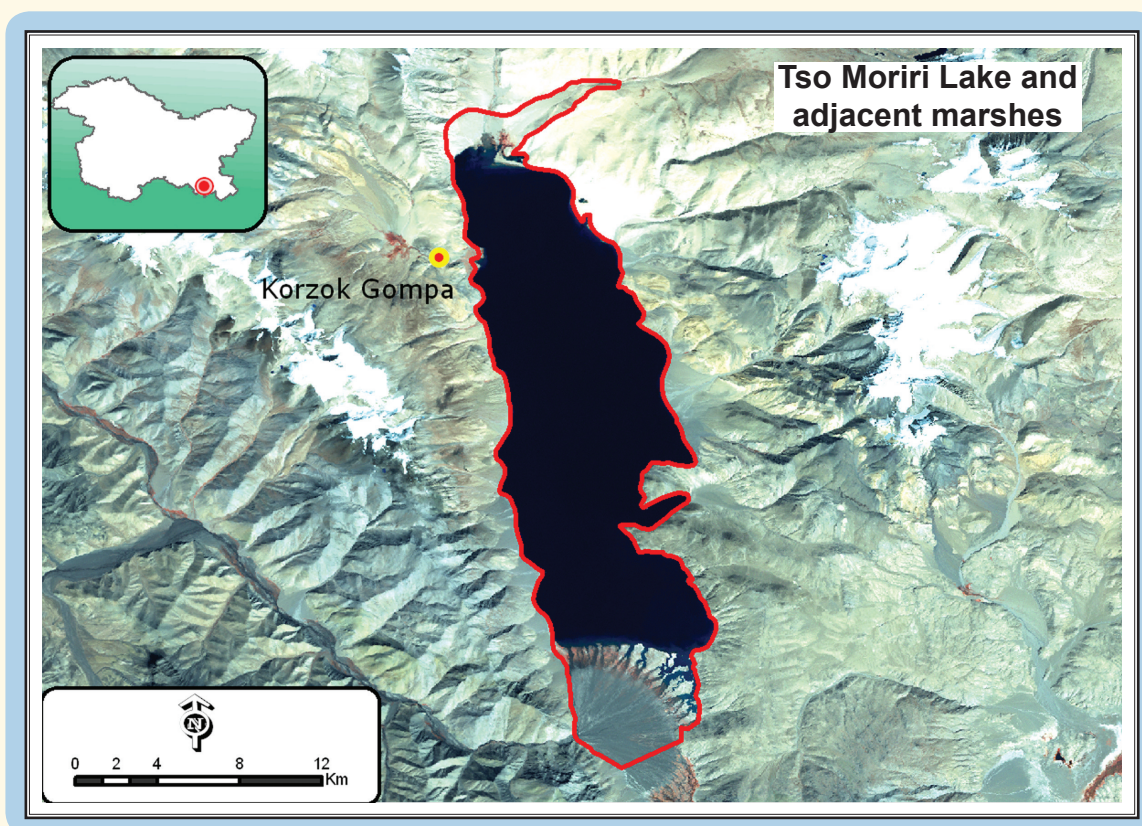
IN-JK-19

IBA Site Code	: IN-JK-19
District	: Ladakh
Coordinates	: 32° 52' 60" N, 78° 19' 00" E
Ownership	: State
Area	: c. 20,000 ha (including adjacent marshes)

Altitude	: 4,650 msl
Precipitation	: 75 mm + snowfall
Temperature	: -40 °C to 30 °C
Biogeographic Zone	: Trans-Himalaya
Habitats	: Aquatic, Alpine Moist Pasture

IBA CRITERIA : A1 (Threatened Species), A4i (>1% of biogeographic population)

PROTECTION STATUS : Wetland is part of the Changthang Cold Desert Wildlife Sanctuary also declared as a wetland conservation reserve by the Department of Wildlife Protection, J&K Govt, and Ramsar Site by the Government of India.



GENERAL DESCRIPTION

Tso Moriri in eastern Ladakh is the largest of the high altitude Trans-Himalayan lakes situated entirely within Indian territory, and was declared as a Ramsar Site in 2003. The lake formerly had an outlet to the south, but has now become landlocked, because of which the water is brackish to saline. The lake is fed by streams and snowmelt from two major stream systems, which create extensive marshes when they enter the lake. It is frozen from December to April. Small islands near the north and south ends are important for breeding waterfowl. The lake is bounded by mountain ranges with peaks exceeding 6,500 msl. On the north and east, the lake is bounded by the hills of the Tibetan cold desert. The western side is

bordered by steeper peaks exceeding 5,500 msl. River Pare Chu, which originates c. 40 km upstream of the lake, flows along the southern side. Between Tso Moriri in the north and the Pare Chu to the south lies the Nuro Sumdo wetland, covering an area of c. 2,000 ha (Mishra & Humbert-Droz 1998). There does not appear to be any vegetation in the deeper parts of the lake, but shallow areas have some *Potamogeton*. Various species of sedge and rushes grow in the marsh, notably *Carex*, *Caragana*, and *Astragalus* spp. characterize the steppe vegetation. *Juncus thomsonii* and *Leontopodium* sp. are also found.

Tso Moriri was declared as a Ramsar Site in 2002. Besides its ecological, cultural and historical importance, it qualifies Ramsar Criterion 2 (wetland supports threatened ecological

IN-JK-19

DHRITIMAN MUKHERJEE



During autumn migration the lake serves as a staging ground for thousands of waterbirds

communities) and Criterion 6 (wetland regularly supports 1% of the individuals in a population of one species or subspecies). According to Ramsar Convention, it is Ramsar Wetland Type O (permanent freshwater lake) and Type Ss (seasonal brackish pools and marshes) (Islam & Rahmani 2008).

AVIFAUNA

Tso Moriri is believed to be one of the most important breeding sites for waterfowl in Ladakh. The lake has the best known and most important breeding ground of the Bar-headed Goose *Anser indicus* in Indian territory (Pfister 1998). Namgail *et al.* (2009) counted 135 Bar-headed Goose in late July in the northern part of the lake. The lake also supports significant breeding populations of Great Crested Grebe *Podiceps cristatus*, Ruddy Shelduck *Tadorna ferruginea*, Lesser Sand Plover *Charadrius mongolus*, Brown-headed Gull *Larus brunnicephalus*, and Common Tern *Sterna hirundo*.

Black-necked Crane *Grus nigricollis* stage regularly on the marshes on the northern edge of the lake, and a pair has been recorded in the area from 2000 till 2013. A pair also made a breeding attempt in 2000 in the same area, but the two eggs and nest were washed away due to the rising level of the lake at that time (Chandan 2014). During 2014, successful breeding by a pair of Black-necked Crane was

recorded in the marshes at the southern end of the lake (Pankaj Chandan, *pers. comm.* 2014).

During autumn migration, the lake serves as an important staging area for a multitude of waterfowl, including the Near Threatened Ferruginous Pochard *Aythya nyroca*. River Tern *Sterna aurantia* is among the 200 species of birds reported by Otto Pfister (2004).

During a 10-day survey between July 19 and 28, 1996, Mishra & Humbert-Droz (1998) found 34 bird species, including 14 waterbirds that breed in the area. At least three Black-necked Cranes and 826 Bar-headed Geese (62% goslings) were sighted in Tso Moriri and Nuro Sumdo marshes. According to Wetlands International (2006), 1% biogeographic population threshold of the Bar-headed Goose is 560. Thus these wetlands harbour more than the threshold. A breeding colony with 250 adults and chicks of Brown-headed Gull, a Biome 5 species (Stattersfield *et al.* 1998), was also found by Mishra & Humbert-Droz (1998).

While the Nuro Sumdo area is important for Black-necked Crane, Tso Moriri is an extremely important breeding area for Bar-headed Goose (Mishra & Humbert-Droz 1998). During our survey in July 2007, 20 bird species were recorded in Tso Moriri and adjacent habitats. A total of 65 pairs of Bar-headed Geese with 150 chicks were recorded during the survey.

VULNERABLE	
Black-necked Crane	<i>Grus nigricollis</i>
NEAR THREATENED	
Ferruginous Pochard	<i>Aythya nyroca</i>

OTHER KEY FAUNA

The large mammal fauna of this IBA includes the Snow Leopard *Panthera uncia* in the surrounding mountains,

PANKAJ CHANDAN



One pair of Black-necked Crane was found breeding in 2000 in the Tso Moriri marshes

Tibetan Wild Ass *Equus kiang* and Tibetan Wolf *Canis lupus chanku* on the plateau. Blue Sheep *Pseudois nayaur* and Nayan or Great Tibetan Sheep *Ovis ammon hodgsoni* are found on the hillsides. Mountain Weasel *Mustela altaica*, Himalayan Marmot *Marmota bobak*, Red Fox *Vulpes vulpes*, and Tibetan Woolly Hare *Lepus oiostolus* are also seen (Rauf Zargar, pers. comm. 2003).

LAND USE

- Agriculture
- Transport
- Tourism
- Urban settlements

THREATS AND CONSERVATION ISSUES

- Disturbance to birds due to unregulated tourism
- Agricultural intensification and expansion
- Urbanization
- Livestock overgrazing

This area used to be closed to tourists and the general public due to its proximity to the international border, but since 1994 it has been opened up. Mishra & Humbert-Droz (1998) have listed the conservation problems that are now arising due to increasing tourism pressure. Korzok, the only village situated near the lake, has become an important tourist centre. Apart from being one of the highest inhabited places in the world, the village has an important Buddhist monastery. The village consists of about 120 households, largely belonging to the semi-nomadic pastoral Changpa tribe. They do not hunt animals, but their large herds of domestic animals (goats, sheep, cattle, horses, donkeys, yak, and cattle-yak hybrids) graze in the marshes and meadows of the wetlands.

A road from Leh, 215 km northwest of Korzok, runs more than 5 km along the edge of Tso Moriri. The people of



ASIF KHAN

Alpine Accentor (juvenile shown above) breeds on open stony slopes and rocky pastures near Tso Moriri

Leh want to establish hotels and tourism centres in these marshes (Rauf Zargar, pers. comm. 2003) but fortunately this has been stopped due to security reasons. The Indo-Tibetan Border Police (ITBP) has established bunkers in this area. Increased movement of ITBP personnel has also increased anthropogenic pressures. In addition, several government establishments exist in Korzok. At present camping is restricted to a selected camping site, and camping elsewhere is illegal. Although tourism is restricted to the short summer, this is also the breeding time of the birds (Mishra & Humbert-Droz 1998).

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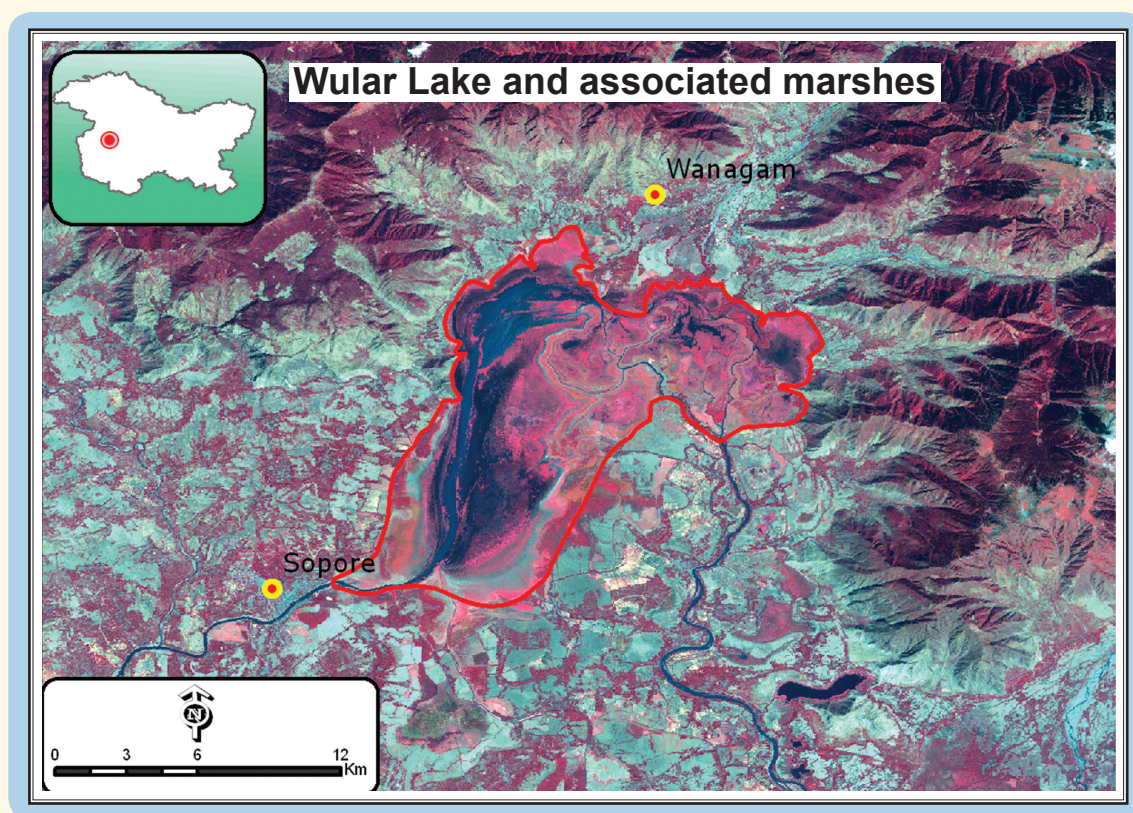
WULAR LAKE AND ASSOCIATED MARSHES

IN-JK-20

IBA Site Code	: IN-JK-20	Precipitation	: 550 mm + snowfall
District	: Baramulla	Temperature	: 1°C to 24 °C
Coordinates	: 34° 25' 60" N, 74° 42' 00" E	Biogeographic Zone	: Himalaya
Ownership	: State	Habitats	: Freshwater Swamp, Riverine
Area	: c. 2,400 ha		Vegetation, Flooded Valley Grassland,
Altitude	: 1,580 msl		Himalayan Secondary Scrub

IBA CRITERIA : A1 (Threatened Species), A4iii (>20, 000 waterbirds)

PROTECTION STATUS : Ramsar Site. Wular Development Authority established.



GENERAL DESCRIPTION

Wular Lake and its associated marshes lie on the floodplains of River Jhelum in the Kashmir Valley. It is gratifying to note that the Ramsar Convention which came into force in 1975 included India as a contracting party in October 1981 and in 1990, among other sites, Wular Lake was one of the initial six wetlands in India designated as Ramsar Sites. Wular Lake has been designated as a wetland of international importance, especially as a waterfowl habitat, for the following reasons: (i) It diminishes the fury of floods, being a natural storage reservoir of flood waters, and regulates the water regime of the Kashmir

Valley; (ii) The lake, along with its interconnected satellite wetlands, is a suitable wintering ground for numerous waterfowl; (iii) It supports a large fishery, contributing about 60% of the fish yield of Kashmir; (iv) The lake sustains c. 15,000 families living around it, providing fish, Water Chestnut *Trapa* sp., Lotus *Nelumbo nucifera* stem and other economically important products.

Wular Lake originally occupied an area of 20,200 ha, but has now shrunk to a mere 2,400 ha. The lake has an elliptical boundary, with a maximum length of 16 km and width of 7.6 km. It is c. 34 km northwest of Srinagar and c. 3 km from Sopore town in the Baramulla district of Kashmir Valley.



ASAD R. RAHMANI

Wular Lake is a Ramsar Site. Despite its status as a wetland of international importance, its natural characteristics were modified through extensive Poplar plantation. Now the government wants to remove the plantation to restore its natural ecosystem

The name Wular is derived from the Sanskrit word *ullol* or Kashmir *wul*, meaning turbulent, a reference to the high waves one encounters while crossing the lake during certain months. Wular used to be one of the largest freshwater lakes of South Asia. It continues to play an important role in the hydrology of the Kashmir Valley, due to its huge capacity to absorb annual flooding.

Wular Lake is surrounded by high altitude mountain ranges on the northeast and northwest sides. Due to its particular topography, Wular Lake faces strong winds.

There is considerable dispute about the size of this lake. According to the Directory of Wetlands of India, the area is shown to be only 189 ha, while the Survey of India maps indicate that the lake area was 5,870 ha in the winter of 1978. According to a study, the area at maximum flood level has decreased from 27,300 ha to 17,000 ha. The revenue records show that the area of the lake is 13,000 ha (M.M. Baba, *unpubl.*).

Wular Lake is heavily overgrown with macrophytes. The margins are covered with *Typha*, while *Phragmites*, *Nymphoides peltata*, *N. alba*, *Nelumbo nucifera*, and *Trapa natans* cover the shallow zones. Villagers harvest some of these species for food. *Salvinia* and *Lemna* cover the surface. A total of 82 species of phytoplankton and 50 species of zooplankton have been reported. The shallow parts also bear stands of Willow *Salix alba*.

AVIFAUNA

The lake was known to be an important staging and wintering ground for migratory birds. Eighty-eight species, including many forest species, have been identified in and around the lake (M.M. Baba, *unpubl.*). Pallas's Fish-eagle *Haliaeetus leucoryphus* that was common here (Loke 1946) has now disappeared and was not reported by M.M. Baba (*unpubl.*). The surrounding forests still have populations of Koklass Pheasant *Pucrasia macrolopha* and Himalayan Monal *Lophophorus impejanus*.

Although there has been a drastic decline in the number of waterfowl due to increased disturbance, even now thousands of ducks and geese still visit the lake. The main species are Greylag Goose *Anser anser*, Ruddy Shelduck *Tadorna ferruginea*, Common Teal *Anas crecca*, Northern Pintail *A. acuta*, Eurasian Wigeon *A. penelope*, Mallard *A. platyrhynchos*, Garganey *A. querquedula*, Gadwall *A. strepera*, Northern Shoveller *A. clypeata*, Common Pochard *Aythya ferina*, White-eyed (Ferruginous) Pochard *A. nyroca*, Red-crested Pochard *Netta rufina*, and Pygmy Goose (Cotton Teal) *Netta coromandelianus*. White Stork *Ciconia ciconia* was a passage migrant, but has not been reported recently. Brown-headed Gull *Larus brunnicephalus* is very common. Little Grebe *Tachybaptus ruficollis*, Little Bittern *Ixobrychus minutus*, Grey Heron *Ardea cinerea*, Little Egret *Egretta garzetta*, Water Rail *Rallus aquaticus*, Common

Moorhen *Gallinula chloropus*, and White-breasted Waterhen *Amaurornis phoenicurus* are resident species.

More recent records are also available. During the BNHS-MoEF Avian Influenza Surveillance and Monitoring study (2005–2007), Khursheed Ahmad recorded sizeable numbers of wintering ducks, dominated by Common Pochard (11,000), Mallard (800), Gadwall (400), Red-crested Pochard (50), and Ferruginous Pochard (20), besides Western Marsh Harrier *Circus aeruginosus* (6), Caspian Tern *Sterna caspia* (100), Black-bellied Tern *S. acuticauda* (40), and Brown-headed Gull (5) in Wular Lake (Rahmani *et al.* 2008).

This site easily qualifies for A4iii criteria as it holds more than 20,000 waterfowl on a regular basis, and is also one of the important stopover sites for many long-distance migrants.

Nearly a hundred years ago, Lesser White-fronted Goose *Anser erythropus* was also reported (Ward 1906–1908). It probably still occurs in small numbers among the thousands of Greylag Geese. Another species reported earlier and likely to occur even now is the Marbled Teal *Marmaronetta angustirostris*. There is a specimen in the British Museum (Natural History) of this species shot in Wular in 1923 (BirdLife International 2001). As this species occurs among the multitude of other waterfowl, it is likely to be missed, and might still be found.

Wular is also one of the few IBA sites where the Near Threatened Lesser Fish-eagle *Ichthyophaga humilis* is reported (M.M. Baba, *undated*). This species was

earlier called Himalayan Grey-headed Fishing Eagle *Ichthyophaga nana* (Ali & Ripley 1987). It is considered Near Threatened by BirdLife International (2001) as it has declined all over its range, especially in India, due to destruction of riverine wetlands, increasing human disturbance, and use of pesticides (Rahmani 2012).

VULNERABLE

Marbled Teal (old record) *Marmaronetta angustirostris*
Pallas's Fish-eagle (old record) *Haliaeetus leucoryphus*

NEAR THREATENED

Oriental Darter *Anhinga melanogaster*
Ferruginous Pochard *Aythya nyroca*
Lesser Fish-eagle *Ichthyophaga humilis*

OTHER KEY FAUNA

Common Otter *Lutra lutra* is reported to be present. Wular Lake supports a huge fishing industry. Six species of endemic Schizothoracid fish have been reported (M.M. Baba, *unpubl.*). They are being replaced by the introduced Common Carp *Cyprinus carpio*.

LAND USE

- Fisheries
- Water management
- Tourism and recreation
- Livestock grazing
- Agriculture



Manasbal Lake is a part of the Wular ecosystem and a large number of fishermen depend on these wetlands for their livelihood

THREATS AND CONSERVATION ISSUES

- Siltation
- Urbanization
- Excessive fishing
- Pollution
- Multi-departmental control

This lake has great social, economic, and cultural value for the people of the Kashmir Valley. But these values put tremendous pressure on the natural ecosystem, more so with increase in human population and pollution. Around 8,000 fishermen are dependent on this lake.

The lake has shrunk to one tenth of its original size due to siltation from surface runoff and the denuded catchment area. It is also contaminated with domestic and industrial waste. Vast areas of the catchment zone have been encroached upon for cultivation. Willow has been planted to supply wood for the cricket bat and wickerwork industries. The Directorate of Soil Conservation is working to reduce siltation. The untreated sewage discharged into the lake results in eutrophication. Furthermore, the Wular is heavily infested with *Salvinia* and *Potamogeton*. These weeds clog the waterways and channels and increase siltation rates. Although fishing is under the control of the Fisheries Department, they either have no effective control, or do not want to control the misuse of fine-mesh nets. All these problems show that to save Wular Lake and sustain the harvesting of its rich resources, and also attract waterfowl, an integrated approach among various government departments is necessary.

Flash floods are a major problem, created mainly due to deforestation. People living around Wular have realized the importance of flood control by the maintenance of good vegetation cover. The people of Garoora village regenerated 100 acres of forest on the banks of the lake after they repeatedly suffered flash floods. After the forest was regenerated, the fury of the floods abated. This example needs replication all around the lake.

Recently, the State Government decided to constitute a

Wular Development Authority on the lines of development authorities for other tourist resorts in the valley. Although a committee has been appointed to formulate a blueprint for the role and mandate of the proposed development authority, it is yet to be seen how far the conservation requirements of this important wetland will be addressed while handing over control to such an authority.

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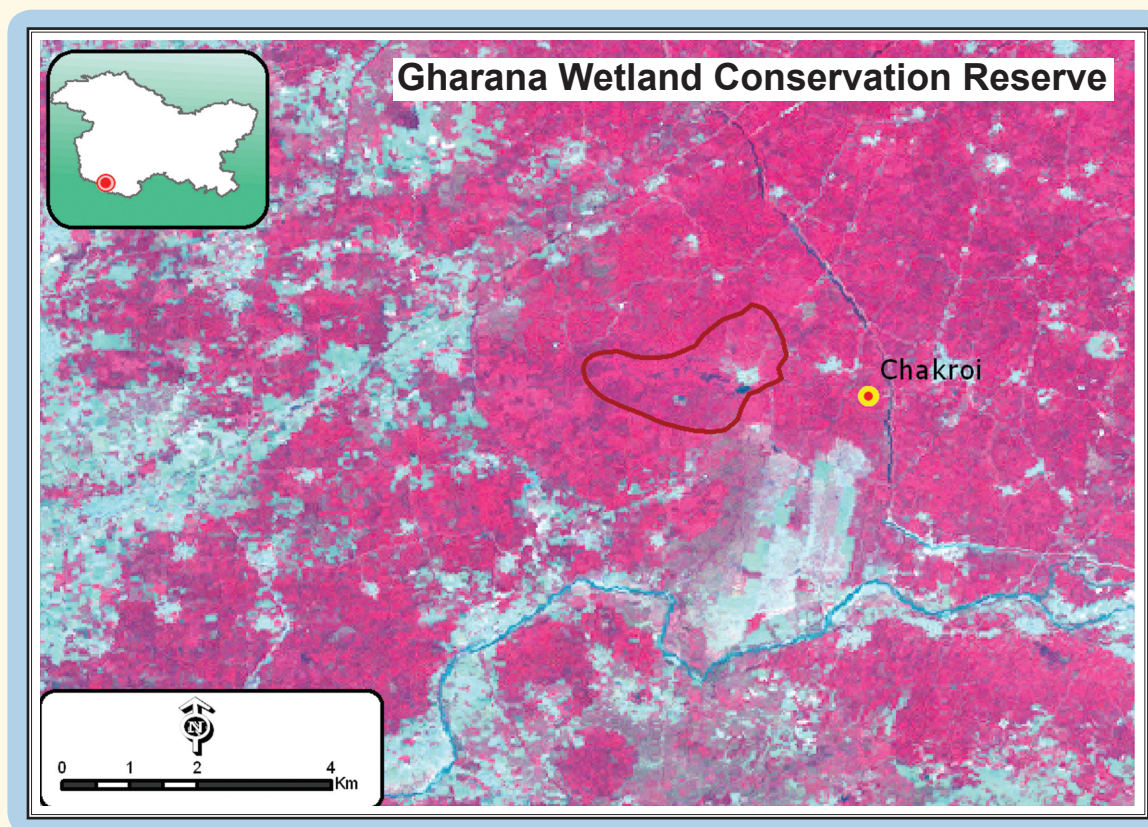
GHARANA WETLAND CONSERVATION RESERVE

IN-JK-21

IBA Site Code	: IN-JK-21	Altitude	: 400 msl
District	: Jammu	Precipitation	: 1,100 mm
Coordinates	: 32° 50' 28" N, 74° 35' 04" E	Temperature	: 4°C to 46°C
Ownership	: State	Biogeographic Zone	: Semi-arid
Area	: 300 ha	Habitats	: Aquatic

IBA CRITERIA : A4iii (>20,000 waterbirds)

PROTECTION STATUS : Wetland Conservation Reserve.



GENERAL DESCRIPTION

Gharana Wetland Reserve is important for migratory birds, and more than 20,000 birds are seen during winter. It is located c. 35 km from Jammu city, extending to the Pakistan border west of Gharana village. This wetland is 8 km from Ranbirsinghpura town. The State Government owns the Indian part of the wetland. Gharana wetland has tremendous conservation and educational importance for the entire Jammu region, being the only site to attract migratory ducks, waders, and wetland associated species every year. Wintering of Bar-headed Goose in Gharana makes J&K the only state to have both breeding and wintering populations of this ecologically intriguing migrant. The site has also been identified by the BNHS as one of the key sites for avian influenza surveillance.

AVIFAUNA

Some of the key species of migratory waterbirds and other wetland associated species are Greylag Goose *Anser anser*, Ruddy Shelduck *Tadorna ferruginea*, Common Teal *Anas crecca*, Northern Pintail *A. acuta*, Eurasian Wigeon *A. penelope*, Garganey *A. querquedula*, Gadwall *A. strepera*, Northern Shoveller *A. clypeata*, Common Pochard *Aythya ferina*, White Stork *Ciconia ciconia*, Painted Stork *Mycteria leucocephala*, Common Crane *Grus grus*, and Demoiselle Crane *G. virgo*. Black-necked Stork *Ephippiorhynchus asiaticus*, Little Grebe *Tachybaptus ruficollis*, Little Egret *Egretta garzetta*, Common Moorhen *Gallinula chloropus*, and White-breasted Waterhen *Amaurornis phoenicurus* are resident species.

There is a need to conduct winter bird surveys in this IBA. More than 4,000 Bar-headed Goose *Anser indicus*



ASAD R. RAHMANI

Due to excellent protection by the Wildlife Department, birds flourish in and around Gharana Wetland and have become quite tame



PANKAJ CHANDAN

Large numbers of waterfowl were captured at Gharana wetland for Avian Influenza surveillance by BNHS, J&K Wildlife Department and the Ministry of Environment and Forests



ASAD R. RAHMANI

IBAs such as Gharana wetland can play an important role in making people interested in birds and habitat conservation

were recorded in 2011 (T. Shawl & Pankaj Chandan, *pers. comm.* 2011) and 2,000–3,000 have been recorded wintering every year from 2005 onwards till the wintering season 2009–2010.

OTHER KEY FAUNA

The mammalian fauna of the wetland environs includes Nilgai *Boselaphus tragocamelus* and Wild Boar *Sus scrofa*.

THREATS AND CONSERVATION ISSUES

- Disputes regarding administrative control with local community
- Crop damage and lack of compensation mechanisms
- Management interventions by Wildlife Department strongly opposed by the locals
- Military activities
- Invasive species
- Unregulated water supply
- Wetland reclamation by villagers

Due to its location, cross-border shelling is a constant problem. The wetland is infested with Water Hyacinth *Eichhornia crassipes* and Typha. While the latter may not be an issue as it is a native plant, the former is a known pernicious invasive in India and has destroyed many wetlands. Flocks of Bar-headed Goose and other migratory species damage the crops of adjoining farms, leading to intense opposition to the Wildlife Department's management interventions, including regulation of water supply, dewatering, and creation of mounds for species such as cormorants.

Due to lack of administrative control by the Wildlife Department and frequent attempts to scare the birds with crackers by villagers, populations of migratory species seem to have drastically declined in comparison to the previous years as observed throughout the winter of 2010–2011.

KEY CONTRIBUTORS

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